MARCH
1956

Approach

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THE NAVAL AVIATION SAFETY REVIEW

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REVIEW OF AIRCRAFT ACCIDENT RECORDS SHOWS 1955 TO BE BY FAR THE SAFEST YEAR IN HISTORY OF NAVAL AVIATION X TO ALL THOSE WHOSE EFFORTS HAVE MADE THIS POSSIBLE I SEND A HEARTY WELL DONE AND URGE THAT WE STRIVE FOR STILL GREATER AIR SAFETY IN 1956 X SECNAV X

The naval aviation safety goal for 1955 was set at a new low rate of 3.5 major aircraft accidents per 10,000 flight hours. It can now be reported that this record was achieved—that all hands can take justifiable pride in a well-earned Well Done.

That's convincing proof of what can be done by concerted, aggressive effort—proof that the *extra* effort needed to reduce the accident rate even further to *3.0 in 1956* is worth its weight in lives saved and effectiveness gained. Sure, each successive reduction is more difficult to obtain, but it can be done—you've proved that!

To help promote further positive accident prevention at the unit level, the Chief of Naval Operations established the CNO Aviation Safety Awards. The 1955 winners of these plaques have been featured in recent issues of the *Approach*. Though there's more than two-thirds of the fiscal year behind, there still remains time for your unit to be a *safe* bet to win.

And remember, there's a greater reward than the plaque—about 84 pilots and aircrewmen are alive today who would have been lost to the Navy and their families except for the progress of the aviation safety program. Think that over and you'll agree that in 1956 we can

Lower The Score, Even More!

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PHOTO CREDIT: Page 28, North American Aviation

This periodical contains the most accurate information currently available on the subject of aviation accident prevention. Contents should not be construed as regulations, orders or directives unless so stated. Material extracted from Aircraft Accident Reports, OpNav Form 3750-1 and Anymouse (anonymous) Reports may not be construed as incriminating under Art. 31, UCMJ. Names used in accident stories are ficticious unless stated otherwise. Photo Credit: Official Navy or as credited. Original articles may be reprinted with permission. Contributions are welcome as are comments and criticisms. Address all correspondence to Director, U. S. Naval Aviation Safety Center, NAS Norfolk 11, Va.

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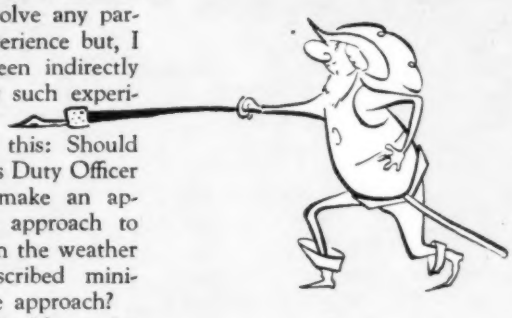
Letters to the Editor

Letters may be forwarded either via official channels or direct on Anymouse forms. While all letters should be signed, names will be withheld on request. Address Approach Editor, U. S. Naval Aviation Safety Center, NAS, Norfolk 11, Virginia.

Sir:

The problem that I have in mind does not involve any particular "hairy" experience but, I am certain, has been indirectly the cause of many such experiences.



The problem is this: Should an NAS Operations Duty Officer allow a pilot to make an approved instrument approach to the air station when the weather is below the prescribed minimums for this type approach?

I feel that he should *not* for the following reasons:

a. If pilots are not allowed to clear to a destination with weather below minimums for the type approach contemplated, then why should they be permitted to attempt an approach when the weather has fallen below these minimums while en route?

b. In a recent survey of East Coast bases the aviation safety council criticized GCA units for allowing pilots to make GCA approaches when the reported weather was below their GCA minimums. It was recommended that pilots be advised to proceed to their alternates in such cases. Shouldn't this apply to other types of approaches as well?

c. When a pilot knows that the weather is below the minimums and yet insists on making a so-called "trial approach," I believe that he does so, not with the intention of proving Aerology wrong but, with the thought in mind that by cheating a bit he may be able to land. This urge to land at a particular airport may be prompted by any number of official or personal reasons.

To be quite frank, a large number of pilots do not agree with me on this matter. They feel that it is the pilot's responsibility to make the decision and if he wants to attempt an instument approach to a landing when the reported weather is below minimums, that is his privilege. They argue that the pilot should execute a missed approach if not contact when minimums are reached. Many of these pilots stand Operations Duty Officer watches.

I realize that this problem is not a new one but has existed for some time. I believe that many accidents could be prevented by instructions ordering Operations Duty Officers to refuse clearances when the reported weather is below approach minimums. The exceptions to this would be in case of an emergency and green card pilots who meet the requirements of OpNav Instruction 3720.2.

The advantages of such an instruction would be two-fold:

a. It would standardize and clarify procedures for clearing aircraft into a naval air station just as they are now standardized for clearing outbound aircraft.

b. Pilots would be relieved of the temptation of attempting an instrument approach when they should be proceeding to their alternate.

Any help or information regarding this matter will be greatly appreciated.

—Anymouse

The above letter raises an interesting problem. Regulations clearly define clearances but not approaches. Comments on this situation by pilots and air control personnel, plus local doctrines, are solicited for consideration and publication. It should be noted that the great majority of operations officers are fully mindful of the definition and the intent of published minimums and instructions. For these individuals any divergence from the established minimums constitutes eitner an emergency or a violation. It remains, therefore, the responsibility of the pilot to comply rigidly to both definition and intent!—Ed.

Sir:

The accident of the Marine HUP in your November issue was read with interest by this squadron. However, we would appreciate more information about . . . conditions of the approach . . . airspeed in approach . . . were safety belts and shoulder harness locked? . . .

G. W. Bierhorst, Lt. Comdr.
Commanding
HU-771

Complete details have been forwarded to HU-771 and are available to other HUP units on request.—Ed.

P-921

NAS St. Louis

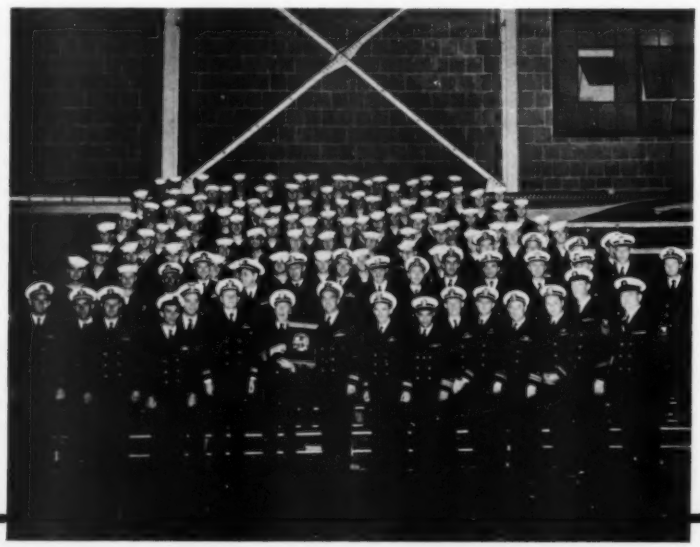
Comdr. Charles E. Stiver
Commanding Officer

Patrol Squadron 921 logged 2771 accident-free hours during fiscal 1955, despite 11 in-flight emergencies ranging from a lost engine at 225 feet altitude to complete hydraulic failures. Some transition fiights were made in P2Vs but most of its flight hours were logged flying PV-2 *Harpoons*. Operations were conducted in temperatures from minus 28° during January in northern Minnesota to 124° in Death Valley during July.

As with most reserve air squadrons pilots of VP-921 hold various civil occupations. Typical are: Farmer, Airline Pilot, Salesman, School Teacher, Engineer and Businessman. The enlisted personnel cover almost every trade and profession from an engineer with a master's degree to highschool students.

Because of the venerable airplanes it has been flying, the accent in VP-921 has always been placed on safety of operations at all times.

Lt. Comdr. Charles A. Bartels
Safety Officer



WRD WINNERS

VMJ-2

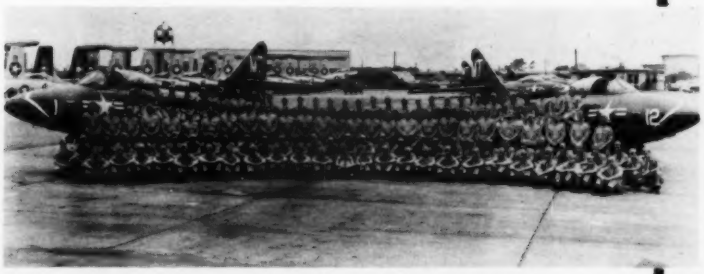
Commissioned in early 1952, Marine Photographic Squadron TWO has a dual mission. Primary assignment is tactical air photo reconnaissance for the Fleet Marine Force and naval forces. The squadron also provides aerial photo training for pilots who will be assigned to carriers and overseas bases.

During fiscal 1955, VMJ-2 took part in TRAEX and LANTFLEX maneuvers with the Second Marine Air Wing. Other activities included participation in the National Air Show at Philadelphia and various other photographic demonstrations.

The squadron attributes its safety record to several factors: Extremely active squadron leadership in aviation safety, an excellent engineering and maintenance section, and an intensive and closely supervised pilot training program. Its system of briefings, line checks, pilot checkoff lists and the aircraft checkout procedures used for the 22 pilots trained during the year contributed to the squadron safety record.

Major Joel E. Bonner
Commanding Officer

Capt. Robert C. Olson
Safety Officer



VF-692

NAS Columbus

During fiscal 1955 a relatively large volume of flight hours was realized by Reserve Squadron VF-692. By flying from sunrise to sunset and at night, with the exception of ordnance flights, all phases of pilot transition to jet operation, both air and ground, were completed by all regular pilots. Ground personnel aided to the fullest extent, often working late hours to permit additional flights.

Squadron emphasis on safety required all pilots to have a thorough knowledge of its aircraft and particularly, the emergency procedures.

At no time did the safety program suggest any curtailment of aggressive fighter tactics. "Flight operations of the squadron," said the skipper, "are as active and vigorous as one could find anywhere." "We feel that a good safety program means learning 'how' rather than 'how not,' and that can add materially to the aggressive and confident spirit that should characterize any VF operation."

Lt. Comdr. Daniel A. Carmichael
Commanding Officer

A-104

During the first half of fiscal 1955 Attack Squadron 104 operated in the Mediterranean Sea area, flying from the USS *Coral Sea*. Numerous air defense and striking exercises were conducted with Sixth Fleet and NATO units. One seven-day NATO exercise resulted in VA-104 aircraft logging over 500 flight hours.

A highlight of the cruise was the squadron's highly successful participation in a display of naval air tactics for Spain's Generalissimo Franco.

While launching for a fly-over at Beirut, Lebanon, VA-104 experienced its only accident of the cruise; an AD was ditched due to engine failure.

The squadron returned home just prior to Christmas 1954 at Jacksonville, Fla. After a period of leave and reorganization the squadron commenced basic training. A change of command followed in early spring. Comdr. D. H. (Red Dog) Johnson was relieved by Comdr. George E. Ford, its present skipper.

Comdr. George E. Ford
Commanding Officer

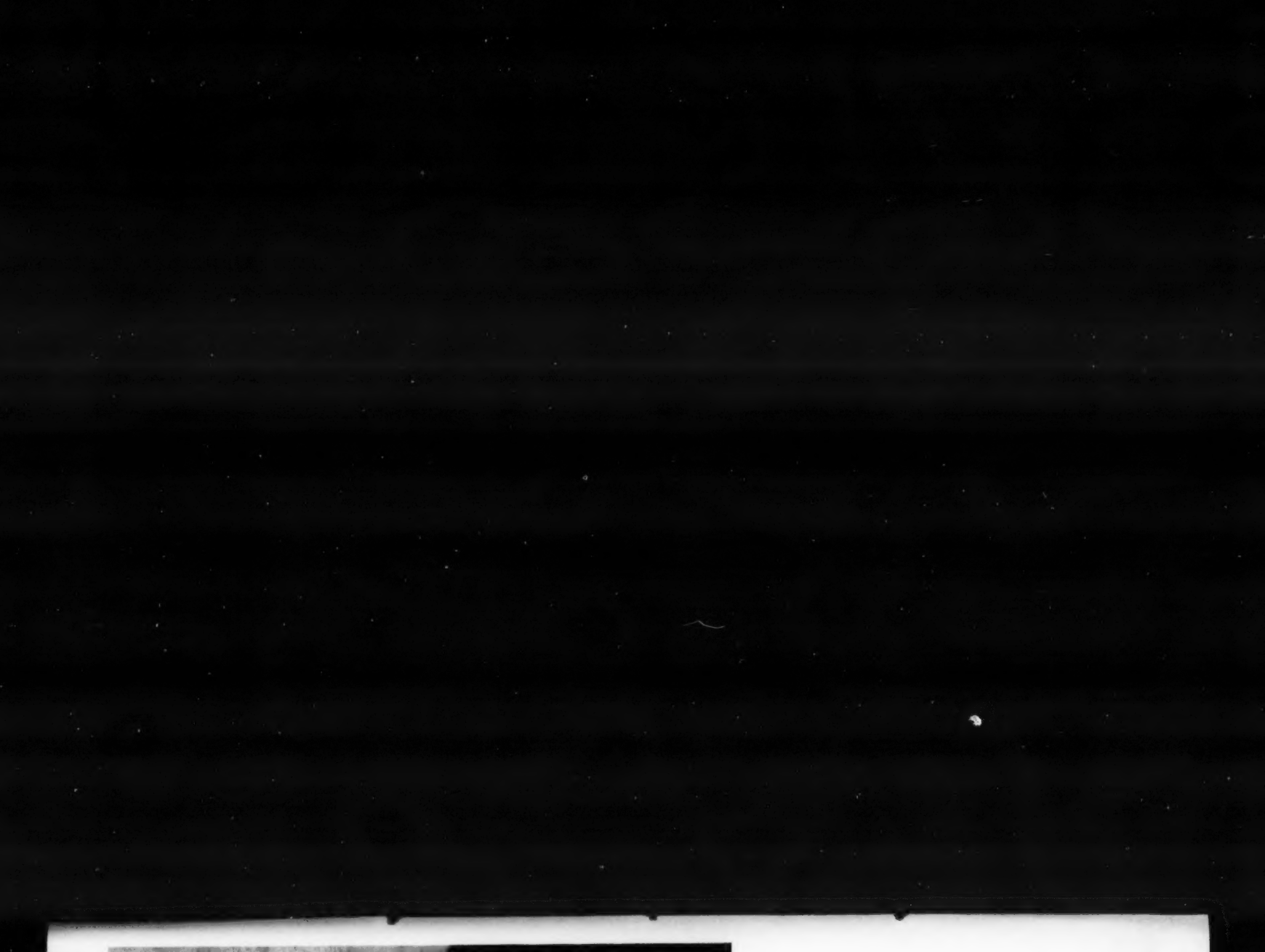
JAMES S. RUSSELL
Rear Admiral, USN
Chief, Bureau of Aeronautics

The present trend in the aircraft accident rate indicates that 1955 may well become Naval Aviation's safest year. The rate shows a reduction of nearly one-third in the past 18 months despite a transition to many new models of higher performance aircraft. The downward trend can only be attributed to an increased safety consciousness on the part of each one of us concerned with the operation and maintenance of naval aircraft.

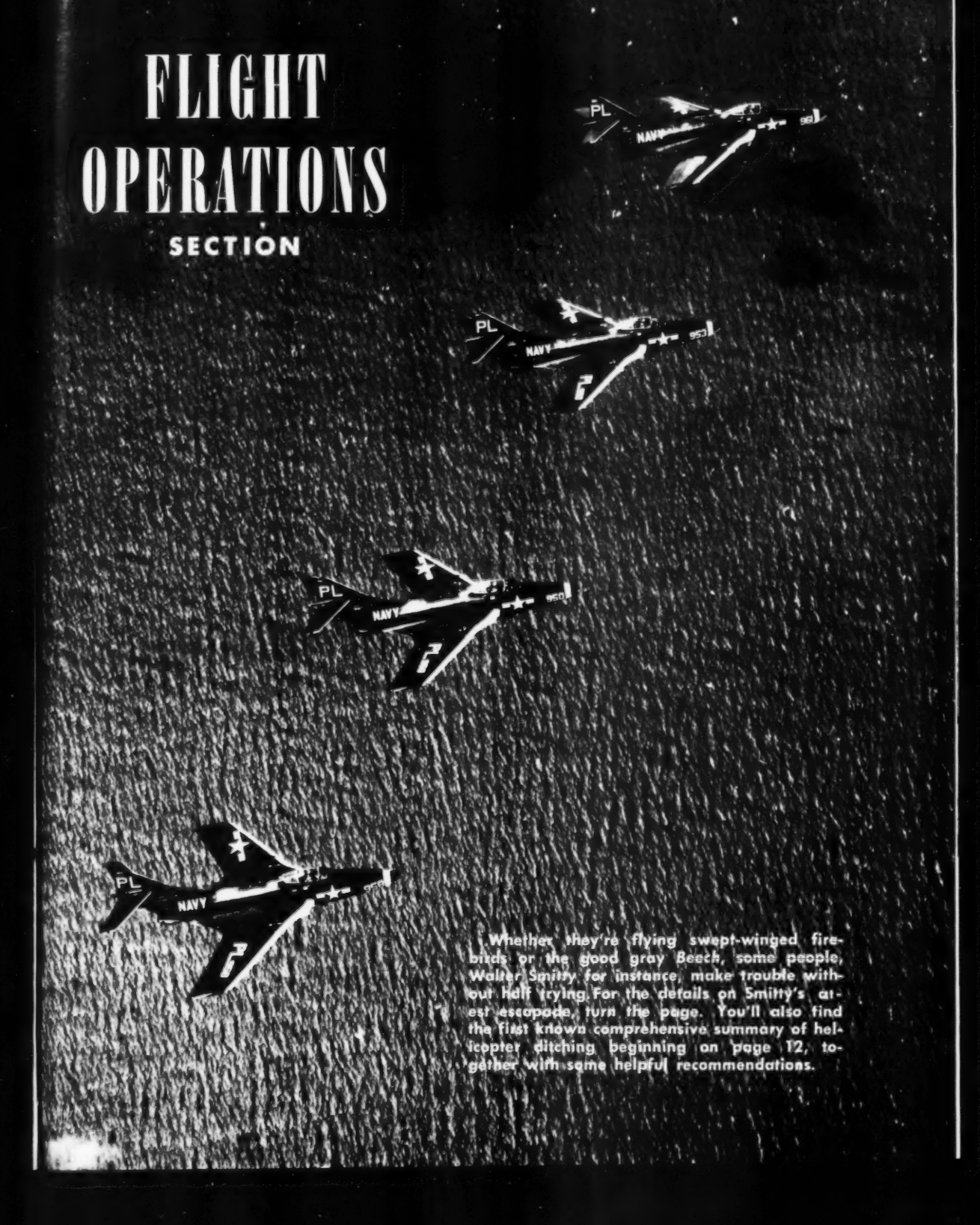
The increasing complexity of modern aircraft and their equipments requires the continuing concentrated efforts of operating and maintenance personnel in safely and effectively using our present equipment, and of the Bureau of Aeronautics in developing better and safer new equipment. It is essential that the Bureau of Aeronautics be governed in this effort by the experience of the Fleet with their equipment. The recently inaugurated Failure and Unsatisfactory Report System (FUR System) provides the rapid communication media for receiving this mass of valuable intelligence from operating activities, and mechanically organizing it for use by the logistic organization. The experience, ideas, and suggestions of each one of you who operate and maintain naval aeronautical equipment is thereby made available to those of us who incorporate them in fleet equipment for the improvement of aviation safety and combat effectiveness. Our continued effective efforts are vitally dependent on this flow of information from the Fleet.

During the close association between the Bureau of Aeronautics and the Aviation Safety Center in the analysis of aircraft accidents I have observed the development of the *Approach*, the Naval Aviation Safety Review. I recommend it to you as an outstanding professional journal for the naval aviator and technician.

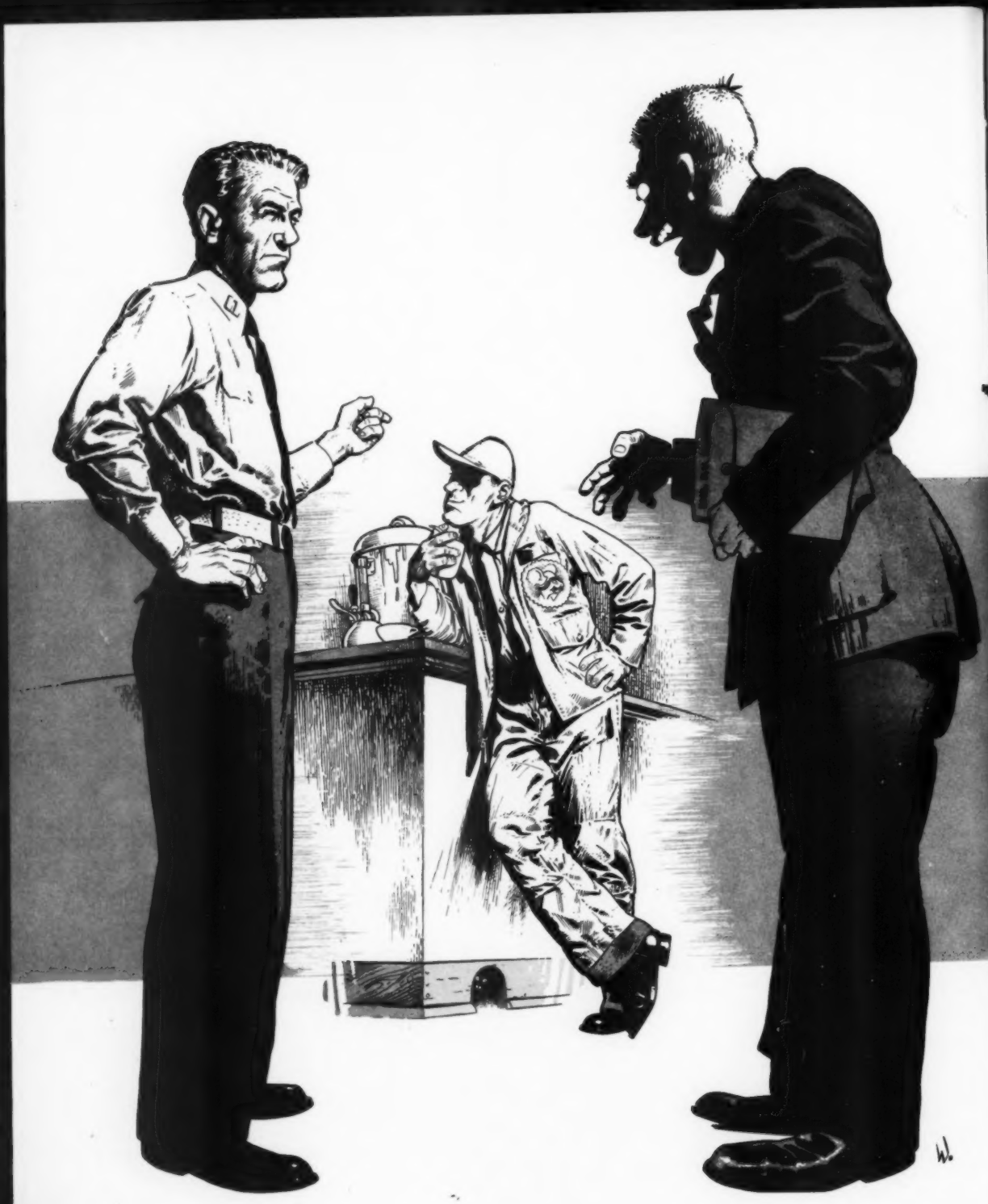
James S. Russell



FLIGHT OPERATIONS SECTION



Whether they're flying swept-winged firebirds or the good gray *Beech*, some people, *Walter Smitty* for instance, make trouble without half trying. For the details on Smitty's latest escapade, turn the page. You'll also find the first known comprehensive summary of helicopter ditching beginning on page 12, together with some helpful recommendations.



Herewith, in response to the number of requests (two by actual count) the *Approach* chronicles another episode in the fabulous career of Lt. (jg.) Walter Smitty, Scourge of the Skies. Smitty's initial appearance was in the August, 1955 issue. With proper apologies to James Thurber, creator of the original character, the reader is invited to participate in another "incident," the details of which are based on two actual Anymouse Reports.

The return of WALTER SMITTY

Lt. (jg.) Walter Smitty, aviator extraordinary, pilot's pilot, air adventurer, lounged against the coffee mess bar and listened indifferently to the readyroom chatter about him. As always, his lean, hawklike face was inscrutable, masklike. Idly his tapered fingers drummed in time with music from the radio nearby. Rocka-rolla-rocka.

Across the readyroom, elbows nudged into ribs and furtive, respectful whispers marked the presence of Smitty the Sky Scourge.

"That's Walter Smitty," a lieutenant whispered to a newly reported ensign, "The

(*Continued next page*)

WALTER SMITTY
(*Continued*)

one and *only* Walter Smitty. And believe me, one . . . " The rest of the sentence faded as Smitty's steely glance flicked about the room.

"Who's Walter Smitty?" The newcomer, Ensign Peavey, was plainly unaware of the reputation of the Sky Scourge.

"Gad, man!" His companion regarded him with pity as he sought to correct this educational deficiency.

"Well," he began carefully, "You know who Lindberg was, don't you? Did you ever hear of Rickenbacker? Well, now forget them and just try to imagine Jesse James playing Captain Video, and . . . " The lieutenant found the task too great and got down to cases.

"Do you know that Smitty once shot off a towbanner?"

"So what's so amazing about that? Peavey was still dubious.

"Nothing, stupid, except Smitty happened to be flying the tow plane at the time!"

Peavey gaped and stared with unabashed wonder at this marvel of military aviation. At the snack bar, Walter Smitty permitted the faintest of smiles to drift across his face. Abruptly he wheeled toward the door.

"Okay, you tigers! His voice cracked vibrantly in the stirring language of airmen, "Launch 'em! Let's get that 'ol Beechcraft into the blue!"

The other pilots flinched slightly and, eyes averted, chewed vigorously on their hamburgers. Chompa-choppa-chomp.

"Well?" Smitty demanded, "Ain't nobody gonna go with me on this hop to pick up them spare parts at Jax?" The answering silence was mute tribute to the awe in which the Sky Scourge was held. Then the new ensign, Peavey, leaped to his feet.

"Sir, *I'd* like to go with you." And the young man was suddenly red-faced under the keenly appraising eyes that swept him. The ensign shuffled nervously under the penetrating glance that seemed to ferret out his innermost secrets.

"You a pilot?" With characteristic directness Smitty's question drove straight to the heart of the matter.

"Yessir, designated three months past, sir."

Again the cool, hard look—weighing, testing, searching.

"Okay let's go, son. A night cross-country'll do you real good."

And the two, master airman and apprentice pilot, strode into the night. In the readyroom, a long sigh from the other pilots marked their departure.

When airborne, Smitty turned the *Beechcraft* to a southerly heading and, as Ensign Peavey watched in appreciative bewilderment, his hands moved knowingly over radio controls tuning in Jax omni. Clicka-screecha-squawk. Under Smitty's sure touch the little twin-engined plane bracketed easily between the Atlantic coastline and the Appalachian mountains. Bracka-braacka-yaw. Nearing Jax, Smitty disclosed further evidence of his legendary prowess as he bird-dogged in on NAS Jax's low frequency range.

Over the range station, the Great Pilot graciously allowed the delighted Peavey to assist.

"Which way's the field from here, son?"

The copilot gulped slightly but was ready with the answer.

"East, sir," and Peavey's heart quailed at the quick frown on Smitty's face. Then the Sky Scourge permitted another of his rare smiles to

be visible as his hawklike vision spied a field with a well-lighted runway dead ahead.

"Never mind, son. Course inbound is 269 degrees. There's the field straight ahead." The copilot wagged head, amazed. Egad! The man's skill confounded even the Radio Fac Charts! The RFC showed the inbound bearing to NAS Jax to be 089 degrees from their position! Peavey's heart swelled at the knowledge that he was flying with True Greatness.

On standard tower channel Smitty requested landing instructions of Navy Jax and the acknowledgment came promptly. Landing runway 27. Smitty descended into the pattern and began his normal approach, Vrooma-zooma-vroom.

Below, on runway 27 at Navy Cecil Field, members of the crash crew glanced up from their task of removing a crippled Banshee *fighter from where it had engaged the field arresting gear following a landing gear malfunction. The unidentified aircraft on downwind continued its approach, and Cecil tower began to call frantically to warn the airplane of men and equipment on the runway. UHF, VHF and Guard frequencies gained no response. Two signal lights then speared their red warning beams at the* Beech. *The crash crew scrambled to clear the runway.*

In the *Beech*, Smitty unfolded another bit of flying lore to the admiring Peavey.

"Ya see lotsa diffrunt kinds lighting on these fields. That cluster of lights up there at the other end of the runway fr'instance. Some new kinda threshhold or boundary markers, I reckon." The copilot bobbed his head in agreement, marveling anew at the uncanny depth perception of the Master Pilot.

The *Beech* touched down neatly, with lots of room to spare, and Smitty allowed the plane to roll out easily with deft touches of braking; Scruncha-screecha-scrunch. Nearing the end of the runway the *Beech* jolted over the arresting gear anchor chain and Smitty spat a blistering remark about fouled-up air stations which permitted such a threat to runway operations. Peavey attempted unsuccessfully to imitate the deep growl of the Sky Scourge and, failing, curled his lip scornfully at this sad-sack airstation.

Now, as the *Beech* threaded its way towards the turn-off, shadowy figures on either side scurried madly for cover. Pat-a-patta-pat. Smitty's contempt increased.

"Wish they'd knock off that blasted red light blinking over there by the tower—danged thing might confuse a inexperienced pilot. Wait'll I get into operations, I'll tell those characters off."

Peavey nodded firmly, resolving to make a few remarks of his own, say to a line crewman, or even a chief, maybe. He glanced approvingly at Smitty and tried to compress his lips into the same bitter line that creased the mouth of the Great Man.

At Navy Jax, a tower operator peered again into the darkness around the field, and seeing nothing, continued to call the Beechcraft. *Some 12 miles west, the Cecil Field operations officer strode the floor in purple-faced wrath as he awaited the arrival of the pilot of the airplane which, unannounced, had just narrowly missed piling into the runway crash equipment.*

The operations office door swung open and a lean, hawk-faced pilot strolled in, cigaret drooping from the corner of his mouth as he flicked a negligent glance about the room. Tossing a flight plan towards the duty officer, Smitty yawned broadly and draped himself with unconscious grace over the counter, smoke curling lazily past half-lidded eyes.

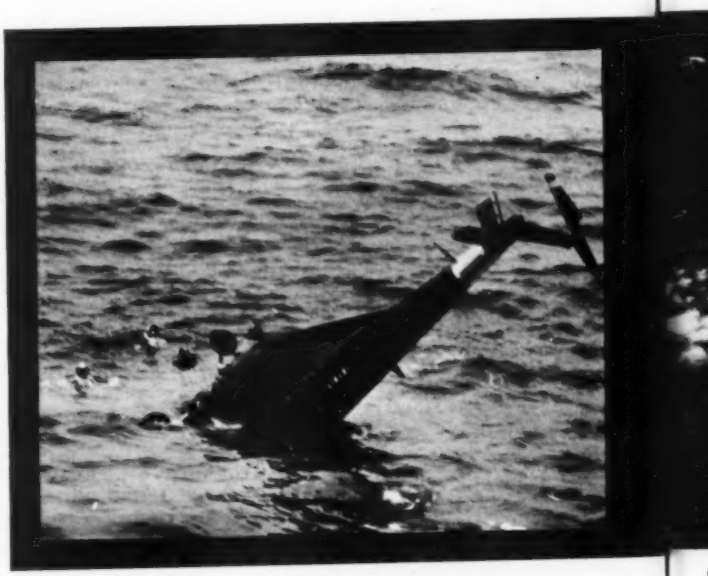
"How ya, pal," the Sky Scourge's steely stare was only half-veiled, "Crummy sort of a outfit you folks run here . . . "

Across the field, the crash crew paused in their task as a sudden outburst of sound errupted from the vicinity of the operations building. Pow-a-powa-yeow.

The driver of the cherry picker squinted towards the source of uproar, flinching as the noise increased in volume.

"Cheeze!" He exclaimed wonderingly, "I think the hangar roof just blew off!" ●

ditching the 'copter



The 'copters weight distribution tends to roll it inverted.

Ditching a helicopter is a little like playing the stock market. "You pays your money and takes your chances." Learning the rules and planning ahead are helpful, but even then, like Wall Street, the whirlybird's salt water antics are hard to predict.

Of course that's not new. A lot of things, aside from women, are unpredictable. But in a helicopter it's mighty confusing when things don't go the way you expect. As an HRS pilot said, "I was both flustrated because the aircraft would not roll to the left and amazed at the rapidity with which the plane sank."

Five ditchings had one fatality each.

No Warning

Most ditching situations occur without warning. Add this to the 'copter's low-flying habit and it is clear that a ditching will have more chance of success if preparation begins before takeoff. There just isn't time to start securing loose gear and briefing passengers after the engine quits. Tool boxes, cargo or equipment should be adequately secured against the sudden shifts or impacts of a forced landing. If the lashings will take the strain of an inverted position so much the better. Once in the water the choppers frequently roll on their back quickly and suddenly.

Ditching briefing should include the body position of cabin occupants. A recommended position is to lean forward in the seat with the arms braced on the knees until contact with the water is made. Passengers should be instructed to stay strapped in until the impact and following overturn motion stops. They should also be warned against inflating life vests until clear of the aircraft.

During an autorotative vertical descent in most helicopter models, escape hatches or panels should not be jettisoned while airborne. Jettisoned parts may fly up into the rotor arc with the danger of fouling the blades.

Door Position a Question

On helicopters with sliding entrance doors there is still a question of whether to lock them open or have them shut for a water landing. You might say it's not an open and shut case.

Successful ditchings have been made under both condi-

(*Continued*)

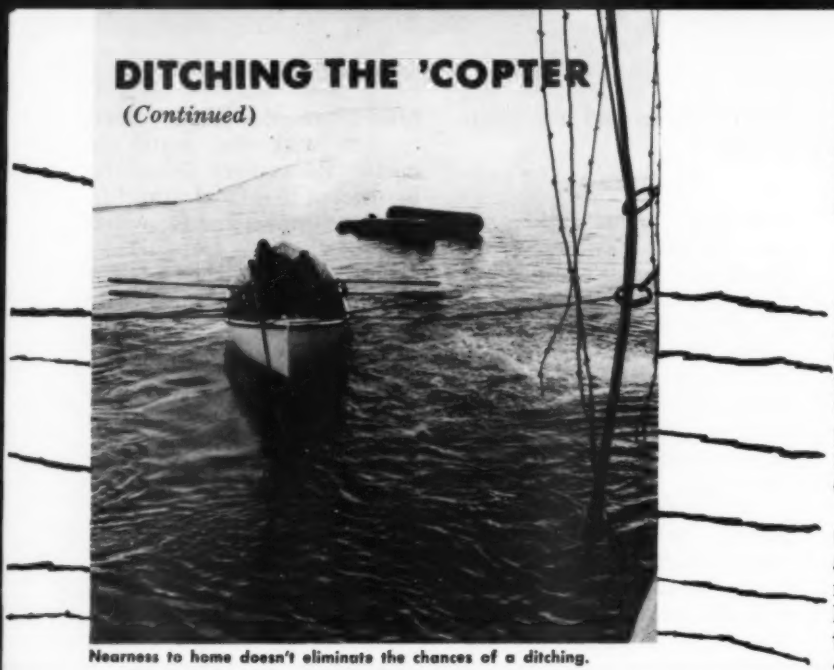
Position of the engine will often determine the sinking angle.

The forward speed should be slowed as much as possible.

Though the helicopter may act contrary at times, ditching does not appear to be any more hazardous than with fixed-wing aircraft. In 51 helicopter ditchings during the past three years, 39 dunkings resulted in minor or no injuries at all to the occupants.

DITCHING THE 'COPTER

(Continued)



Nearness to home doesn't eliminate the chances of a ditching.

tions but there is not enough evidence to say positively which is best. One accident board suggested that closed cockpit and cabin hatches aided in keeping the aircraft afloat longer, if the closed side was toward the water.

One thing is sure. Leave the door alone if the helicopter is at low altitude and a cabin occupant must unstrap himself and move to the door to slide it into its preferred position. The security of attachment of personnel to their seats is more important.

Suppose you are forced to ditch with the entrance door closed and it jams. The records do not show any instance where emergency escape hatches failed or were difficult to jettison. In fact the reverse is true as most were reported as being easy to open.

A crewman of an HO4S recorded his experience this way. "As soon as we hit I released my safety belt and started for the big door, which was open. As soon as I stood up water gushed in the door and I was sort of out of control. As soon as the compartment filled up I could see well enough to open the escape hatch. It opened easily and before I knew it I popped up to the surface. Once I got my bearings I didn't have any trouble getting out."

One more word on this door situation. If you aren't familiar with break-a-way wire, find out about it. There has been one case where the emergency release on an entrance door was secured with regular safety wire and it could not be jettisoned.

The position of winches and safety straps should be considered. A HUP pilot said, "My escape was delayed about 15 seconds as I became entangled in the hoist cable and sling which fell on me." Also, it has been suggested that the crewman's safety sling in the HUP be regarded with caution as it may possibly block the crew's exit. On the HO4S it seems preferable to detach the safety strap across the cabin door in the event of a ditching.

Controlled Ditchings Differ

As noted, most ditchings are true power-off emergency landings. Cases of controlled ditchings where the pilot has full power and complete control are infrequent but an important difference in technique is suggested by one accident board.

"The pilot retains control of the helicopter and brings it to a hover. Passengers and crew members, including the copilot, depart the aircraft and take the necessary survival gear with them. The pilot then moves the aircraft downwind, executes the ditching procedure, and attempts to rejoin the group in the water."

If you know you are going to ditch and want a life raft under you, this controlled power-on ditching is recommended. Even though your ditching bill calls for removal of the life rafts the record puts the odds against it. In the majority of power-off helicopter ditchings, no survival gear, other than life vests worn by the occupants, was removed from the aircraft.

Attitude Important

Attitude toward the big splash is important as a flight surgeon's comments indicate. Concerning the ditching of an HO4S he said, "The uniformly cool-headed manner in which each of the personnel involved effected their successful escapes without serious injury not only saved their lives but speaks well for their command structure and sound indoctrination which insured

such readiness."

At present there is no special helicopter dilbert dunker. The suggestion to provide one was made several years ago but at that time it was not felt necessary due to the similarity between all cockpits. With the number of whirlybirds increasing every year, and accompanied by more distinct and separate design characteristics including greater passenger capacity, the provisions for a helicopter dunker are expected to be studied with more emphasis. Meanwhile, frequent checkouts in the familiar standard dilbert dunker remain the best preparation for building individual underwater confidence.

One difference has been suggested for helicopter personnel using the dilbert dunker. Instead of wearing a parachute harness, it is recommended that a regular PK-2 raft be used. It is felt that the personnel involved would then be accustomed to taking along the raft which is not attached to their person.

Follow the Handbook

Pilot technique in putting a helicopter into the water follows that recommended in the particular flight handbook. However some items which apply generally to all models are briefly covered here.

The initial objective is for a touchdown with as little forward speed as possible. The pilot should also make every effort to cushion the impact. Most of the pilots who ditched were able to accomplish this and the reports often said the touchdown was as soft as a normal wheel landing.

Some nose positions of the ditched helicopters became extreme but most were level or slightly nose-high as in the recommended technique. After the first impact the pilot should settle the aircraft into the water by decreasing the collective pitch. In a no-power landing after all forward motion has stopped, fully depress the collective.

At the same time that the collective is fully depressed, the pilot should attempt to roll the helicopter to the side away from the entrance. Rolling the 'copter on its side stops the main rotor by dipping the blades into the water and prevents injury to the occupants while they are leaving the aircraft.

Fully depressing the collective to a minimum blade angle permits the rotor blades to dip into the water more easily and eliminates, as much as possible, any tendency for them to skip on the surface. In the HRS the practice of depressing the collective control serves the additional purpose of making it easier to exit from the cockpit.

HRS/HO4S

Pilots flying single-rotored helicopters such as the HRS/HO4S said they could not always keep the aircraft rolled to the desired side. The HRS/HO4S practice is to roll to the left but when the rotor blades contacted the water the aircraft usually rolled back to the right and continued over into an inverted, nose-down attitude.

Sinking Time Erratic

Even though the water entry is good, don't make any bets on how long the airframe will float. You will probably lose. The HRS/HO4S model has stayed up for as long as 10 minutes and gone under in as quick as four seconds. These times however, are the extremes. The usual time afloat was from 1 to 5 minutes.

HUP

Of the 11 HUPs ditched in deep water none stayed afloat longer than 60 seconds and one sank "immediately." Av-

(Continued)

Thoroughly brief all passengers and crew—tie down all gear or baggage before takeoff.

DITCHING THE 'COPTER

(*Continued*)

erage time on the surface was about 25 seconds. Once in the water, pilots had more luck rolling the HUP in the desired direction and holding it there, probably due to the tandem rotor configuration.

HO3S

During the last three years six HO3S helicopters were ditched and none resulted in fatalities or serious injuries. Like the HRS the HO3S buoyancy is unpredictable. One sank immediately, possibly due to damage from its 10-knot forward speed on impact, while the others stayed afloat from 20 seconds to 9 minutes.

Of the 51 ditchings, 75 percent involved the models discussed above. The other four types included the HTL, HTE, HRP and HO5S. These ditchings provided insufficient information for any evaluation of their dunking tendencies.

Ditching Drills Good

Ditching drills are good insurance because a man becomes familiar with what is expected of him during an emergency. Also, *any mental preparation in meeting the unexpected is never wasted time,* and the unexpected can be a simple thing as one pilot found. "I escaped out the left emergency hatch," he said, "but had difficulty in finding the emergency release handle due to the inverted position of the compartment and the water therein."

Considering that a helicopter "doesn't float so good" it would seem unnecessary to remind anybody to clear the aircraft immediately. However, there was one pilot who could have used a hint in that direction, even though we admire his determination. Here's his statement.

"I kept trying to fly the aircraft and restart the engine without success until I finally started to breathe water and decided there was little point in attempting to fly the aircraft any longer."

So, in capsule form, the word on helicopter ditchings might be expressed as "know before you go" and "when you got to go—git!" ●

Truth and Consequences

A DIGEST OF RECENT AIRCRAFT ACCIDENTS

Neither pilot recalled moving gear handle during a touch-and-go.

RIGHT HAND—WRONG CONTROL—An instructor and student were shooting touch-and-go landings in a P2V. Several seconds after a normal touchdown the gear retracted and the aircraft slid to a stop on its radome and belly.

Immediately after the accident, examination of the cockpit revealed the gear handle in the UP position. Neither pilot remembered touching or moving the gear handle up. No malfunctions of the hydraulic or landing gear system were discovered.

The accident board found that the gear was down and locked on initial touchdown and concluded that one of the pilots moved the gear handle to the UP position after initial touchdown by an unconscious motion of which he was not aware and does not recall.

Endorsements on the accident report brought out the fact that the squadron had logged 27,000 touch-and-go landings in 12 months without incident prior to the accident.

During the training program, instructor and students fly from both the left and right seats. On a touch-and-go landing the instructor, according to doctrine, always moves the flap handle forward to the 10-degree down position and moves the varicam toggle switch to zero the varicam. The varicam and flaps are on opposite sides of the control pedestal as is the flap handle opposite the gear handle. It was felt that inherent in this touch-and-go procedure is the possibility that pilots may inadvertently or unconsciously mistake the gear handle for the flap handle, throttles or varicam toggle switch.

Touch-and-go-landings were conducted at such low basic weights that the aircraft would be light on the mounts at all times, making it mechanically possible to raise the gear handle while the wheels were still on deck.

FLIGHT PLANNING—An SNB had been airborne about two and one-half hours upon passing the high cone of the destination radio range. The pilot immediately called for a GCA approach and after initial GCA contact reported voice reception intermittent and fading. He continued attempts to regain GCA contact and did not concentrate on range orientation because he had heard that the range was unreliable. However the range was observed to be operating normally by another aircraft at the time of the accident.

After reporting visual contact with lights on the ground, several unsuccessful visual orientation attempts were made below the overcast. Having been airborne about three and one-half hours and with a reading of three-tenths fuel remaining in the left main tank, the pilot ordered the aircraft abandoned. Although near the coast and uncertain of position only the plane captain put on a life vest. Fortunately bailouts were over land and no injuries were reported.

Considering the amount of fuel estimated in the left main and in the three other tanks which had not been burned dry it was the opinion of the accident board that at least one hour's fuel remained. Additionally it was found that the pilot did not at any time attempt to use the radio range after communications with GCA (*Continued on next page*)

Truth and Consequences
(Continued)

VA AD-5N

LOST CAUSE — The endorsement on the accident report observed that it was difficult to understand how a pilot with 691 hours of flight time, "could take off at night in an area with which he was not familiar, short of fuel, with marginal electronic navigation equipment, and apparently without even knowing the course to his destination 18 miles away!"

The pilot in question had completed a 3.7-hour cross-country flight in an AD-5N with his final destination an air station about 14 miles north of a large city. En route the radio compass would not home properly and he relied mainly on GCI steers to accomplish his hop. The plane arrived in the area after sunset but weather was clear with visibility reported as 15 miles.

In order to disembark two crew members the pilot landed first at a municipal field close to the south side of the city. Time on the ground during this passenger stop was seven minutes and it is doubtful if the pilot left his aircraft. After filing a flight plan he took off for the air station, bearing 016 degrees, 18 miles from the municipal airport.

Immediately after becoming airborne the pilot requested a steer. He reported only 20 minutes fuel left. The tower informed him that the UHF/DF gear was out of service.

An offer of GCA assistance was accepted by the pilot and identification turns were commenced without success. Even though the pilot stated he had the city lights in view he never found the air station. Though he failed to employ dead reckoning navigation, visual orientation or low frequency ranges, prefering to let ground personnel navigate for him, no effort was made to employ IFF and fly a lost plane pattern.

Twenty-eight minutes after takeoff the pilot reported his fuel gage read EMPTY and the tower again advised him to return to the municipal field. He objected on the grounds that municipal did not have fuel but then agreed after the tower said a truckload of fuel would be sent for him.

Ten minutes later the AD's engine quit and the pilot reported he was on a westerly heading with the city lights astern. He set up a glide in the clean condition and planned to ditch, stating he knew there was a town around and wanted to avoid hitting a house. The crash scene was about 46 miles bearing 230 degrees from the air station.

Contact with a large tree tore the plane apart. The cockpit section landed in an inverted attitude 40 yards beyond the point of main impact. The pilot was knocked unconscious, received a scalp cut and several broken bones in the left foot and right hand.

The possibility of carbon monoxide poisoning was discounted by the investigating flight surgeon and the pilot was reported as not being affected by physical fatigue or emotional conflict during the flight.

VF F9F-8

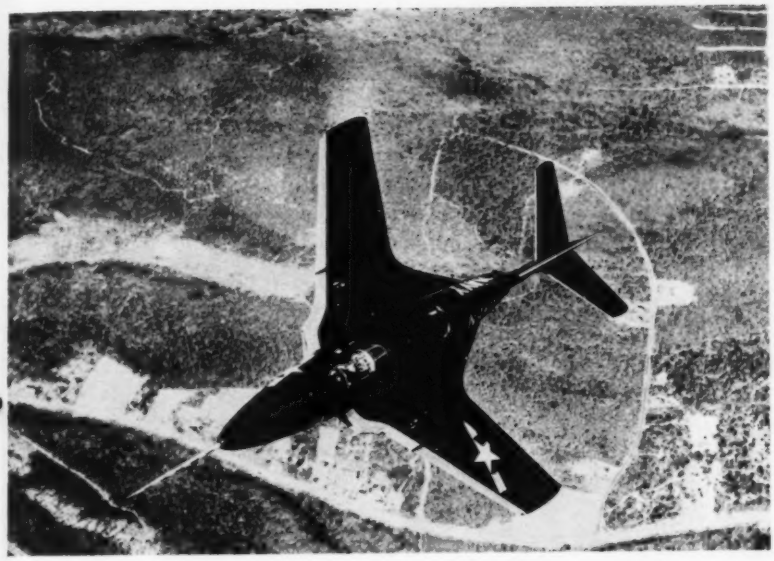
QUICK BREAK—Upon completion of an air-to-air gunnery exercise an F9F-8 tow plane and its *Cougar* escort headed for home. Clearance was received to make a tow drop on the duty runway and both aircraft were at about 300 feet altitude over the runway. The escort plane was flying about 1500 feet astern and 200 feet to the left of the tow plane.

After the tow was dropped the escort plane in the rear was cleared to break first. This was a local practice which was used to prevent the escort plane from extending his run over into the traffic pattern of a nearby field.

The escort pilot commenced his break in a climbing right turn to reach the downwind altitude of 800 feet. Halfway through his turn the pilot caught a glimpse of the tow plane below him and before the wings could be rolled level he felt a collision. The escort plane received only minor damage but the tow plane's tail was damaged and it crashed into the sea.

Witnesses reported that the tow plane broke almost immediately after the escort. Two members of the board simulated the break at altitude and found it easily possible for the tow aircraft to pull through on a hard break into a flight path which would result in a collision. For the tow pilot to see the escort aircraft it was necessary to look up and back through the top of the canopy.

Though the unorthodox break-up used for tow planes



The hazards of an unusual landing break were investigated too late.

and their escorts had been in use for some time and had been accepted as doctrine, no official sanction for that procedure was discovered.

It was recommended that pilots scrutinize closely any procedure differing from normal to uncover possible additional hazards to flight. It was also recommended that pilots be reminded of the canopy fogging characteristics of the F9F when descending from high altitude at low power and that they remain well clear of congested traffic areas until visibility is restored.

F9F-5

NO ALTERNATE—On his VFR flight plan the F9F-5 pilot estimated 2 hours and 15 minutes of fuel aboard. After an hour and 30-minute flight he contacted the tower at his destination and was informed that Air National Guard jet facilities had been taken by ANG units on maneuvers. A NOTAM to the effect that no jet facilities were presently available was not on file at the pilot's home field or at his intermediate fuel stop.

Fifteen minutes elapsed from time the pilot arrived over his destination until he selected an alternate and departed on course. He chose a civil field which had no listed jet facilities or UHF radio facilities, though an Air Force base with all possible jet facilities was equidistant from his position. An estimated 600 pounds of fuel was consumed in this orbiting period.

Departing on course the bird dog became erratic and static made positive station identification impossible. Receiving an indication of station passage at his alternate a penetration was made but no airfield or city was in sight. During this time the bird dog needle was fluctuating, turning 360 degrees at times. Static precluded orientation by an aural null.

At that point the pilot requested a UHF/DF steer though he did not call "Mayday" or use guard channel. Steers began to be received from an Air Force base 100 miles distant and the pilot elected to head toward this field, holding 12,000 feet.

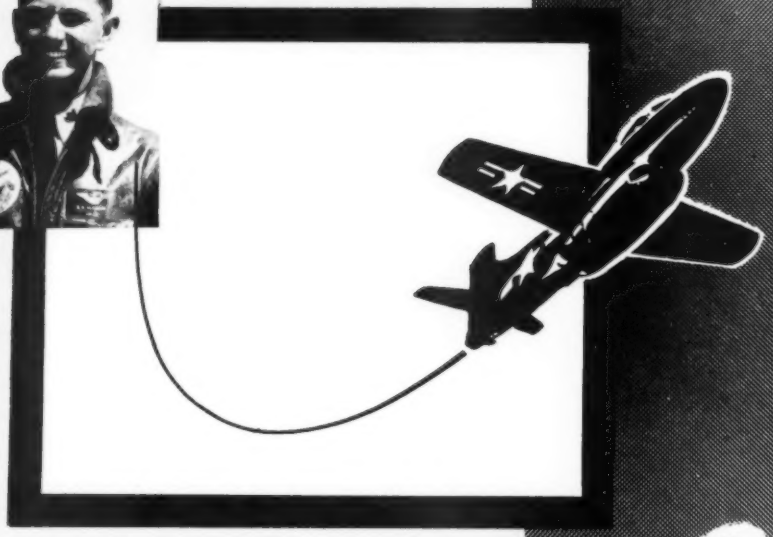
When the fuel gage read 400 pounds the engine flamed out and after the field was in sight a straight-in approach was set up from 6000 feet. The pilot began a flareout too high and the aircraft settled and struck the deck nose-low. Initial impact was about 800 feet short of the runway at 11½ G. The landing gear, which was down, was wiped out and structural damage was sustained by the fuselage.

At touchdown the aircraft had been airborne 2 hours and 27 minutes. About eight gallons of fuel remained.

The antenna lead-in cable of the AN/ARN-6 was found shorted out on the armor plate.

Pilot error was considered to be the primary cause of the accident in that the pilot elected to fly to an alternate airfield from a known position over an acceptable field, departing at relatively low altitude with only 1500 pounds of fuel remaining. This course of action was taken in spite of the fact that the radio compass was determined to be unreliable immediately after departing on course. ●

Lcdr R. N. Glasgow
Executive Officer, VF-191



This article was written as a class assignment by Lt. Comdr. R. N. Glasgow while he was attending the Naval Aviation Safety Officers Course at USC last fall. A naval aviator since 1942, his first tour was with VC-33 in West Pac flying F4Fs. He logged his first jet time with VU-4 at Chincoteague in 1952. After serving on the CNARESTRA staff, he attended JTTU, NAS Olathe prior to joining VF-191 as executive officer.

Tiger TRAP

Can you break a wire coat hanger with your bare hands? Well, yes and no. Nobody can break it on the first try. But if you keep bending the wire back and forth soon the metal will get tired and break. So you can break it, but it requires many applications of force.

The same principle applies to the wing of the airplane you fly. It won't break with a single application of force, such as the designed limit G load , but if repeated applications are made the wing will break too. And it is certain that you bend that wing many times every time you fly.

Then all you really need to know to stay out of trouble is just how many times that wing needs to be bent before it will break. Well that answer is simple you say, just stay below the limit G and it will never break. And you are right. That is you have the right answer but do you know why it's correct?

Just a correct answer to a problem is hardly enough. Behind the answer of a certain G limitation on any airplane are hours and hours of engineering mathematical computations. From these figures the designer knows how much life there is in an airframe and just how many times you have to bend that airframe before it will break. These figures also show that there is a point where there is little enough load applied that the material will never fail.

With the coat hanger, if you don't put enough force into your bending, the piece will last forever. This would be below the limit G of the coat hanger. The same with the airframe. There is some load where you can apply force for an indefinite time and the wings or tail will never come off. This, however, runs the G level way down. It certainly is of no use to have a military plane that is going to last forever if it can't stand more than 1 G.

So we up the limit G to get performance. Right here we run into Sir Isaac Newton; for every action there is a reaction. The reaction to raising the G limit is the lowering of the length of life of the airframe. In fact, by raising the G limit to the breaking point of the structure we can shorten the life span of the aircraft to one hop; the first flight at ultimate G strength on the airframe. This is certainly not too practical either but at least we have the problem bracketed now. We can have a plane that lasts forever at 1 G force or we can have a one flight aircraft at ultimate G strength.

Obviously our answer lays in the middle; design the aircraft for a moderate life at a moderate G force. The Bureau of Aeronautics and the aircraft industry have evolved a set of figures for each type airplane to give just this set of circumstances. From past history it is known that a certain type aircraft will have imposed on its structure a certain number of G forces over a certain length of time. For example purposes let us take a hypothetical case:

A fighter type has been found to pull loads of 7 G, 10 times; 5 G, 15 times; and 3 G, 60 times in 100 hours of flight. With these figures a new plane for the same mission is designed. Using a safety factor of 1.5, the actual airframe might be designed to carry not just the expected 7 G loads, but an ultimate of 11 G. And you say, so what if I pull 9 or 10 G, the thing will stay together. Yes, that's probably true but the hooker is that you have used up an excess of the planned life of that airframe in one flight.

Let us say that the figures given were total numbers of G that could be put on that airframe in 100 hours, or, 70 plus 75 plus 90 equals 235 G. This one flight then would reduce your total by 10. If you continued this pattern at 10 G for every hour of flight the airframe would fail at the end of 23.5 hours. Even though you never exceed seven G, if you pulled that every hop in a similar manner, you would shed a wing or tail in 33.6 hours. Back to the same old story of life of the airframe versus forces applied.

But perhaps you say, so we have used up the estimated G and the airplane looks fine. Don't you believe it. Every piece of that structure is a mechanical computing machine with a memory. That main wing spar remembers every force that was applied and furthermore keeps a running total. When that total reaches the strength level of the metal, the spar just gives up. It is tired, fatigued and ready to break. You might bring the plane back after a rugged hop and forget the whole thing after a good night's rest. The plane will remember though and keep a tab on how soon it will get tired.

Since tired structure, or fatigue, is becoming a major factor in our present high-speed aircraft all pilots must be aware of the limit G. The designers have carefully planned the load and the time that an airframe can stand in service use. These people are professionals. We as pilots demand that their work be the best possible. However, we as pilots must also be professionals and fly the airplanes within the limits set down. Operational fatigue problems can be beaten by professional pilots, who fly the airplane to the design limits and use its full capabilities without overstressing the airframe. Be a Tiger, but be a professional Tiger; know your Limit G! ●

ANYMOUSE and

OH, THAT SWITCH!

When Anymouse in his F9F-5 reached a strange field, the weather clobbered in rapidly and great sheets of rain started to fall.

"Coming off the 180 I could not locate the divebrake override switch. The tower had informed us that the runway was 5500 feet long and I knew I'd need that little crutch. So I started a long approach, looking for that switch.

"I came off the 180 a little fast, still looking for that switch. By this time it was raining so hard that the windshield directly ahead afforded no visibility at all. I took off some power and began my approach, still looking for that switch. The flashing red light on the fire truck caught my eye and I mentally cussed it. I realized I was still a little fast and high so I took off more power, and looked for that switch again.

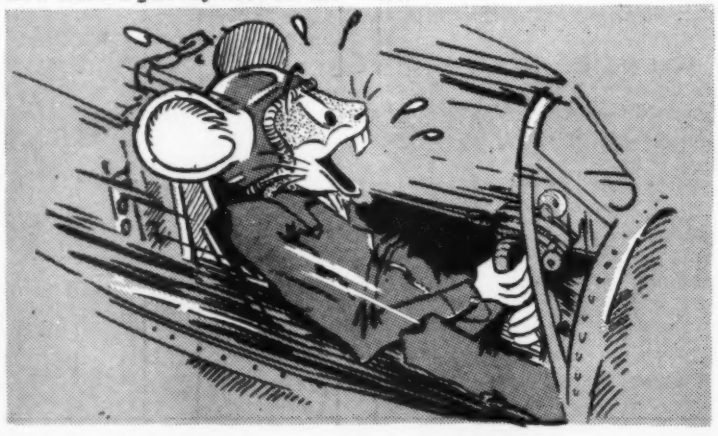
"A sudden glance up in time to line up with the runway—saw the threshold go under me, so I chopped my power, which was way late, and I flew her on down to the deck, flared, touched down, and fumbled for that switch again. The airplane felt as though I was drifting to the left and it was, although I was definitely on the deck, still looking for that switch. I countered the drifting with rudder and the rollout straightened.

"I knew that the end of the runway was not far off and craned my neck to see it. I tried a little brake which had no effect. Still looking for that switch I realized that if I didn't slow down I was in for trouble. Out of the side of the canopy I caught sight of the end of the runway. Brakes were useless as the runway had become a small lake. Hacking off the power entirely and cutting all the switches I could find, I became airborne again as the end of the runway, dropped off in a sharp decline leaving me high but not very dry.

"By nimble manipulation of the rudder pedals, I kept the airplane on an even keel until she hit the earth. There was a road up ahead and no matter how hard I put my feet on the brakes they were not helping at all. Two cars crossed in front. The airplane then hit a shallow ditch, pitched up and was airborne again momentarily. Immediately it crossed the road and came to a halt.

"A check of the cockpit revealed that all switches were off along with that *#&$# divebrake override switch. Upon investigation, it was found that the airplane had sustained no damage.

"Among the several things I learned and would wish to pass down the line are: 1. Beware that ole devil distraction; 2. Don't depend on a chance to take the place of technique; 3. Expect poor braking on wet runways; 4. Don't file for a destination that is marginal if you expect to go VFR; 5. For gosh sakes know that cockpit like you know the inside of your wallet."



his hairy tales

Anymouse reports are submitted by Naval and Marine Corps aviation personnel who have had hairy or unsafe flight experiences. As the name indicates these reports need not be signed. The purpose of Anymouse Reports is to help prevent or overcome dangerous situations. Forms for writing Anymouse Reports are available in ready rooms and line shacks. All reports are considered for appropriate action. Send reports to the Naval Aviation Safety Center, NAS, Norfolk 11, Va.

ODD 'N EVEN

Anymouse was flying in his AD-4B on a DVFR flight plan, cruising at 10,000 feet westbound on G-4 when he nearly collided with an eastbound plane DVFR flying at the same altitude. A second incident occurred when Anymouse was flying in the same direction (east) at 9000 feet within two minutes of a second eastbound plane at 10,000 feet. Both aircraft were on Green airways 4 on DVFR flight plans.

"I reported this as a flight violation" remarked Anymouse "but was informed by flight service that I was wrong."

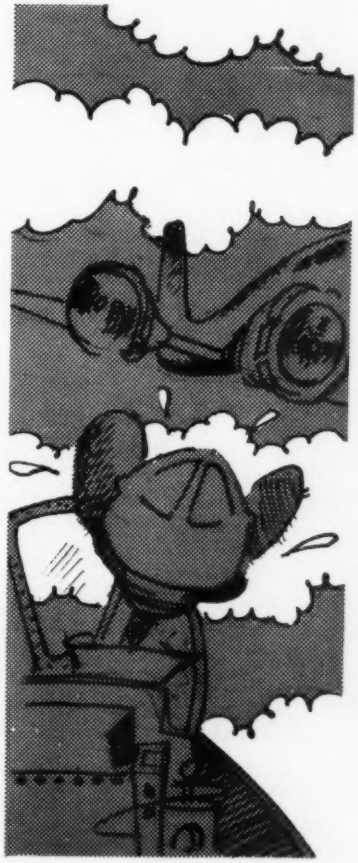
He added, "Too many pilots and clearing officers are not aware that there are altitude restrictions when flying DVFR or VFR in control areas . . . particularly airways. Odd and even altitudes are specified in the Radio Facility Charts."

LOOK OUT!

In this hairy tale Anymouse states he wants to emphasize the potential danger which exists after an IFR clearance is cancelled and the flight continued on VFR.

He was at 7000 feet altitude in an SNB 15 minutes south of Spartanburg and had been on instruments. Breaking out in the clear Anymouse cancelled his IFR flight to save time and began a 500 feet-per-minute descent. However the area he was in was hazy and naturally made silver-colored aircraft difficult to see.

"I had just reached 6000 feet" Anymouse said "and there it was! A B-25 on opposite heading! He hadn't seen me and I hadn't seen him. Neither of us had time to make a move before 'swish,'



and we had passed. I estimate the distance at about 300 feet.

"The point of this near mid-air collision is evident. One must maintain a scrutinous lookout for aircraft at all times, especially when letting down VFR on airways."

(*Editor's Note*: *An article on mid-air collisions is in the mill. Meanwhile, Anymouse and the Aviation Safety Center urgently solicit YOUR near-miss report via either official channels or Anymouse forms.*)

CANOPY CRACKED

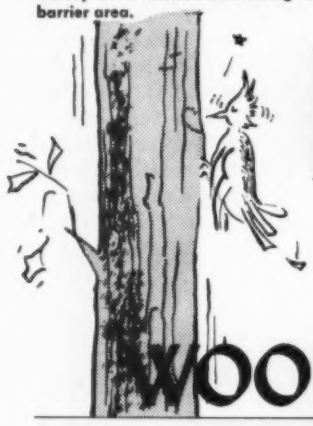
"I was number 3 plane in the flight and at our cruising altitude of 30,000 feet I started to feel lightheaded," said Anymouse. "I went ahead and joined up on the number 2 plane anyway. Just after joining up I passed out.

"At 20,000 feet I came out of it enough to hear the number 2 pilot yelling at me over the radio. I took a couple of deep breaths of oxygen and that cleared my head. While checking around to find out what happened I found the canopy was still open about one-half inch.

"Evidently my mask wasn't on tight enough and I didn't get enough oxygen for that altitude. Hereafter I will check the canopy after takeoff and also keep my mask good and tight."

(*Continued on page 26*)

De-hooked by flight deck potholes, a fighter can cut a swath worthy of a McCormick-Deering combine as it tears into the barrier area.



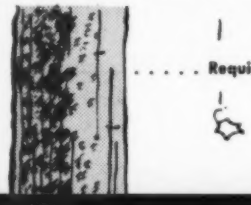
DIG THAT CRAZY WOODCHOPPER!

Man, you can really flip over this kind of deck gouging.

Just a glance at these pictured results of hook-point gouging of flight decks brings to mind the phrase about ". . . swords into plowshares." At least it looks like there's considerable plowing going on in the "south 40" of carriers. Certainly the number of furrows scooped out of the deck planking indicates that flight deck maintenance folks have a year-

Flight deck crashes like this . . . .

. . . . . Require extensive deck repairs like this.

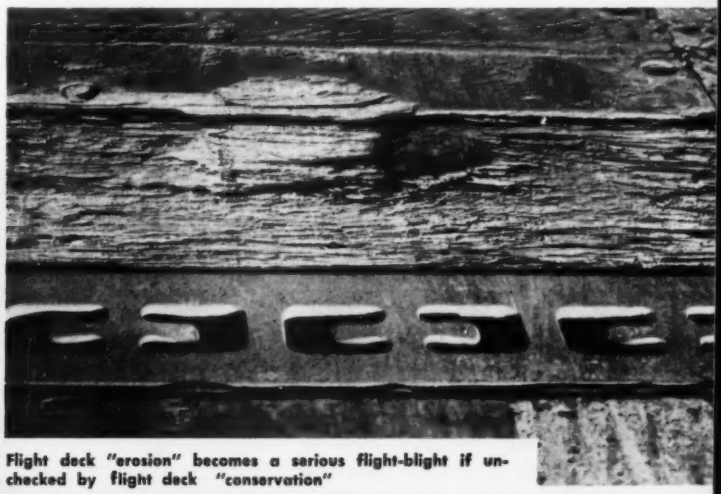


'round reclamation project on their hands in combating hook-point erosion.

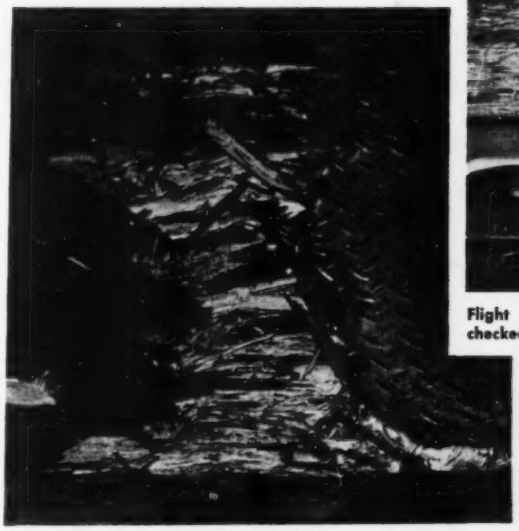
It's also pretty obvious, from the harvest of accident reports, that without constant scrutiny and repair of the arresting wire area, carrier tenants can expect a harrowing recurrence of broken hook-points and a bumper crop of fence-busting airplanes. Only the most careful tending of the flight deck landing acreage can prevent this sort of barrier blight.

So, an Airman's Almanac might say that now's the time to replace those gouged planks, to cover those dished-out "terraces" around metal plates and flashings, and to level those tie-down stumps in the aft pasture. Tend these chores daily and you'll weed out one of the all-seasonal threats to safe carrier operations.

Without proper care, a flight deck can become a many-splintered thing. ●



Flight deck "erosion" becomes a serious flight-blight if unchecked by flight deck "conservation"



Tale of a tailhook— Hook-point parted company when it tripped over the lip of a flight deck plate.

ANYMOUSE

(Continued)

TURN FOR THE WORSE

An R4D was to depart from a West Coast air station for a destination in the Middle West.

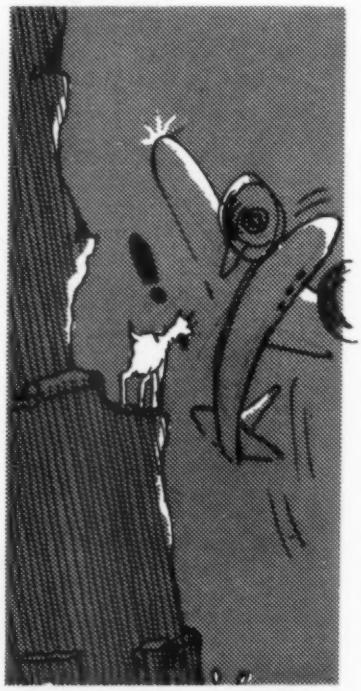
As departure time neared, a low moved across the mountain areas with ice and low ceilings over most of the route. The plane commander had 5000 hours in R4D and R5D models but for the previous 10 months had been assigned administrative duties. Anymouse was substituted as copilot 45 minutes before takeoff because the scheduled copilot had no actual IFR experience.

"We cleared on Green 3 at 13,000 feet," began Anymouse, "and had to fight ice from Donner's Summit eastward. We arrived over the Ogden range at 12,400 feet with 2500 rpm and full throttle. Indicated airspeed was down to 100 knots.

"Our fuel stop was at minimums with freezing rain so we elected to shoot an ILS at Salt Lake City municipal. We landed successfully, but little did I know that our choice would bring us as near death as I ever care to be again.

"The plane commander and myself were both dead tired and wanted to cancel. However there were no accommodations for our 15 passengers so we refiled for the next leg.

"Incoming airline pilots said we could get on top at 12,000 and we taxied out and took off on the ILS runway. I was flying on this second half of the trip and I went on instruments shortly after takeoff. We began to pick up ice right away.



"The PC told me to fly a back-course ILS departure and without thinking I began to turn *away from the needle!*

"Holding a 30-degree correction for two minutes didn't get us back to the localizer so I held 45 degrees. Shortly thereafter we hit some choppy air which was odd as the whole area was stable at the time.

"Almost at that instant I looked at my heading and realized I was flying toward the peaks northeast of the field and was to the right of the localizer instead of the left side. I rolled violently into a left turn and headed west. At about the same time the PC yelled that he saw the ground coming up. The occasional downward visibility was lost and we continued our climb after returning to course.

"On the trip back we flew the same departure VFR from Salt Lake City with speeds and times as exact as possible. We missed one peak by about 500 feet and were headed for the sheer face of a cliff on a second peak when I turned left to a west heading.

"That I turned away from the needle when flying outbound on the back course may appear stupid to other pilots. However, fatigue was a big factor in this error. I recommend that a hop like this be flown with a mike in your oxygen mask.

"I have 6000 hours, green card and together we had 27 years flying. Had I studied the area carefully on departure this incident would not have happened. I am convinced that any pilot can make a mistake when he doesn't plan and is tired."

Headmouse reports that when flight surgeons read this one they agreed, with feeling, that (a) Anymouse was a very fortunate pilot, (b) that had the plane augered into that mountain "we would still be looking for some evidence of why the plane crashed!" and (c) that they fervently hope some other tired "anymice" will read and heed fatigue.

IT'S WHAT'S UNSAID

Some of the Anymouse Reports we received have a lighter side, the humor coming not so much from what is reported, but from what is left unsaid. For instance, we've wondered a long time about

the Anymouse report which consisted of a single sentence. "I will not cause the skipper to go around," written 25 times. When things get dull put your imagination to work on the events which must have caused this.

Here's another report which is just as intriguing. We think the plane commander who wrote it has remarkable self-control in the face of adversity, but feel the cockpit would have been blue if his thoughts had been spoken.

"One hour after takeoff on a routine patrol in a P2V our gross weight was 71,600 pounds and flight altitude was 1000 feet. Amid the confusion of answering a surface ship's challenge and preparing a position report, the copilot dropped his clipboard which struck the starboard feathering button with a resultant loss of power.

"Rated power was applied to the other engine and when the copilot started to feather the "bad" engine, the situation was discovered and corrected.

"Normal cruise power was set up again. To relieve the tingling in the lower part of their spines, both pilots put their seats all the way aft and let George fly it. A shipping contact 30 minutes later alerted the now relaxed cockpit.

"When removing his left foot from an unauthorized but convenient resting place, the copilot's left pants leg caught the starboard mixture control and the starboard engine quit again.

"Thereupon the copilot and navigator exchanged seats and the flight was completed without further incident." ●

FROM THE HEADMOUSE---

Re: Goggles, Mikes, Helmets

For Anymouse who asks three timely questions on design of safety and survival equipment:

Goggles. They are not the ideal goggle *when located on top of the helmet.* Records show more than one instance of a pilot being embarrassed, handicapped or incapacitated by having the right equipment in the wrong place.

These new goggles on the way

The goggles are an item of safety. Safety equipment is meant to be used—hydraulic fluid, smoke, flame, dust, dirt and "foreign objects" have no set and fixed time to come zooming up in your face. On ejection from high-speed, high-altitude aircraft, the face curtain will usually hold the goggles in place. The present goggles, even with the disadvantage you listed, have a stock number. Your eyes do not.

Can they be improved? Sure. New designs in goggles are being procured right now. Visibility has been improved and comfort and fit have been given primary consideration. The dates and quantities are not available but, they are on the way.

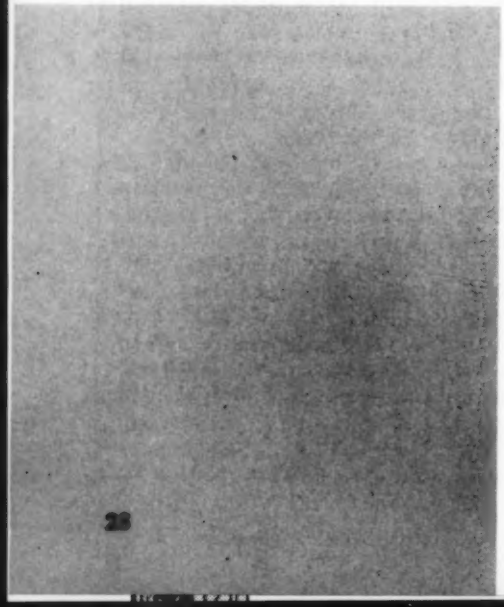
Mikes. The short length of the oxygen mask microphone was corrected by the Aircraft Electronics Material Change Bulletin 163–54. A suggestion on installing the new long cord—a bit of soap applied judiciously will permit *pushing* the cord into the mask rather than *pulling.* The use of needlenose pliers is unwise because of the danger of splitting the mask body.

H-3 Helmet. A single piece skull tub has already been procured and is presently being distributed in limited quantities. Anymouse modeled this one for our September cover. The new helmet is the end product of much research, engineering and design in protection, comfort and efficiency. It eliminates the goggle problem with an enclosed retractable visor.

An article on "Hard Hats" is now in preparation for the *Approach,* and should furnish additional answers to your questions.

Safety Council Notes

Excerpts from some of the Navy's 88 Safety Councils throughout the world, who provide local leadership and emphasis to the naval aviation safety program.



USMCAS, El Toro—The problem of the effect of noise on personnel working on jet aircraft during engine runups was discussed. A project is in progress wherein mechanics doing such work during the past year or more are to be given audiometer tests to determine possible effects on hearing. (Note: An article on the subject of noise effects appeared in the October issue of the *Approach*).

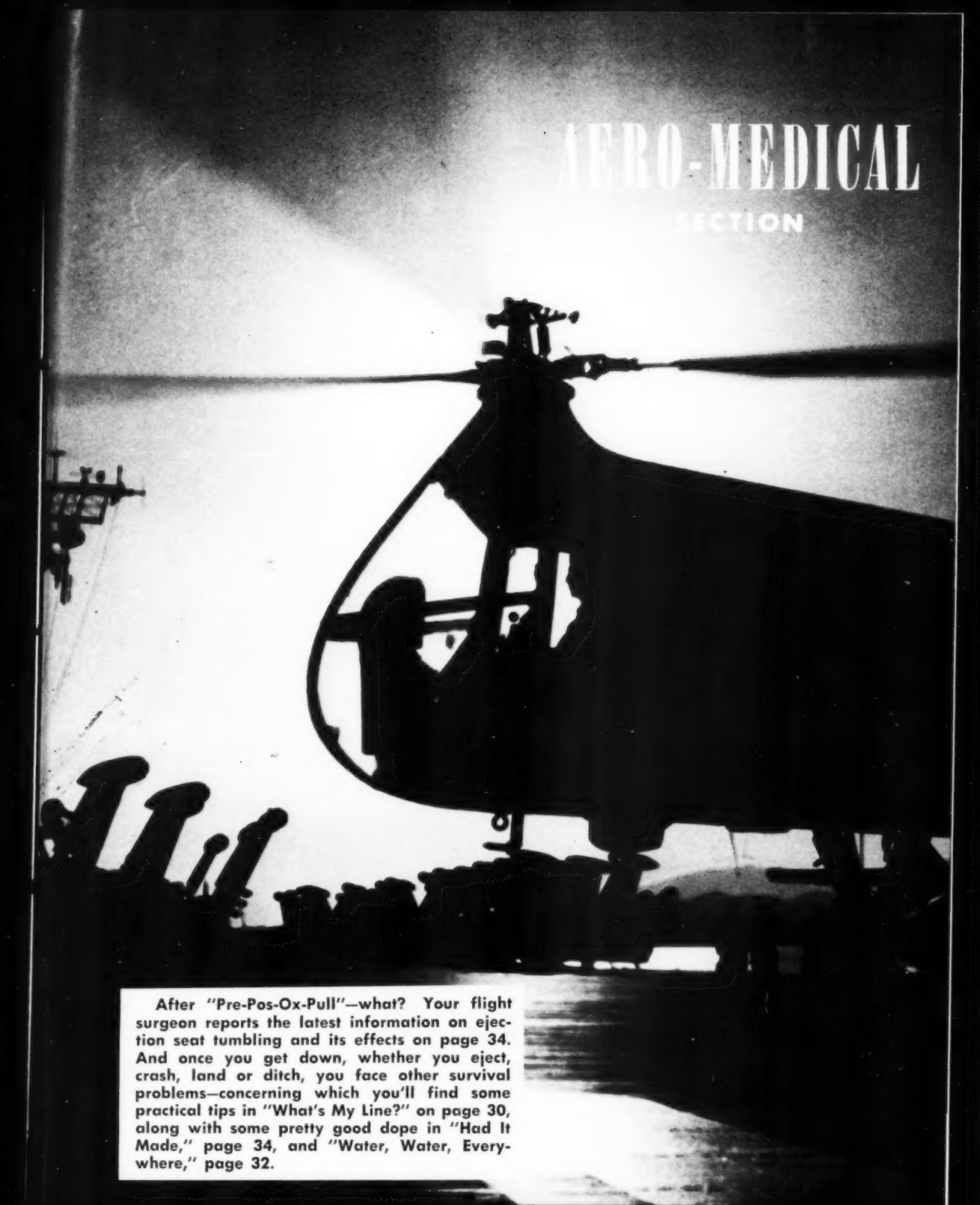
FLogWingLant Continental—Emergency lighting during night takeoff and landing operations was discussed. Noting the high percentage of accidents during those maneuvers it was recommended that battle lanterns be installed and lighted during night takeoff and landings. This would provide an additional safety factor while providing a regular check on the condition of the emergency lighting system.

NATTC, Memphis—The medical committee briefed the council on a possible cause of an SNB accident and recommended that all pilots be aware of the dangers of habit interference causing the actuating of the wrong control. In this case the pilot was accustomed to riding in the left seat but at the time of the accident was occupying the right seat. Following his habit, he reached *across* the pedestal to raise the flaps which raised the gear instead.

MAG 31, Miami—In the interests of preventing drop-tank contamination during storage periods, it was recommended that all tanks be stored upside down with the openings, where possible, covered with a fairly porous material. This allows water to get out without allowing wind-blown material to get in. Frequent inspections should be made.

FLogWing Pac—Safety council members were in agreement that all crew members on the flight deck will remain in their assigned seats with seat belts fastened during landings and rollouts. A crew member standing behind the jump seat in the R6D or between the pilot seats in the R5D can be a missile hazard in the event of an emergency stop.

AERO-MEDICAL SECTION



After "Pre-Pos-Ox-Pull"—what? Your flight surgeon reports the latest information on ejection seat tumbling and its effects on page 34. And once you get down, whether you eject, crash, land or ditch, you face other survival problems—concerning which you'll find some practical tips in "What's My Line?" on page 30, along with some pretty good dope in "Had It Made," page 34, and "Water, Water, Everywhere," page 32.

Messy tangle of snarled cord, or versatile companion to downed airmen? For just how parachute shroud lines can be lifelines in the problems of survival, read Sandy Survivor's answers to . . .

What's my line . . .

Sandy Survivor ditched his plane, and being a well-educated pilot he saved his parachute with particular attention to the shroud lines. He looked for other rafts to tie to his own—but Sandy was alone, alas.

Busying himself with the tasks at hand, he used a shroud line to lash his mast and to secure his equipment so it wouldn't be washed away. He then made sure that his

antenna kite was flying high with an extra length of line.

With another strand he rigged an extra sea anchor in case the one provided was lost. He bound his socks to his trousers with cord to keep his shins warm by night and unsunburned by day. A head-covering, and wind-and-spray shield, all constructed of shroud lines and chute cloth, provided further protection.

Fish appeared plentiful and he decided to catch a few. So Sandy sliced a shroud line, and removed one of the inner strands, which are just the right weight for fish line.

Hunger satisfied, his next project was a sail, which would make him more visible —and also hastened his progress, toward he knew not what!

"What" was a duel with a rambunctious swordfish. Once Sandy was thrown from the raft, but since he had tied himself to it (with shroud line), he was able to get back in. Then he made a spear by tying his knife to an oar—with shroud line. Now it was an even contest. Touché! And Sandy emerged victorious over the swordfish, with only a torn shirt.

Shroud line makes fine thread when it is unravelled, so Sandy repaired his shirt in order to be properly dressed when he reached the shore, which was now visible.

Alas, the place was deserted —not even our Man Sunday came to greet him.

If his plane had conveniently crashed on this isle, Sandy had planned to make a shroud-line wick to burn lubricating oil, and to make a shelter by tying the parachute on a wing. But the plane had crashed at sea.

So Sandy quickly made a shelter by hanging a tarpaulin over a line (shroud line) tied between two trees. That first night ashore he slept soundly in a hammock, made of chute cloth and hung by shroud lines. Its gentle swaying reminded him of the sea he had so recently left.

The next morning he dined sumptuously on fish cooked, instead of raw; (after making a fire with a friction bow—using shroud line for the bow). While he ate, his mind was busy with plans to make a bow and arrow to vary his diet; to weave a dip net from shroud thread in order to catch some small sea life close to shore; and to make shroud line snares and nooses.

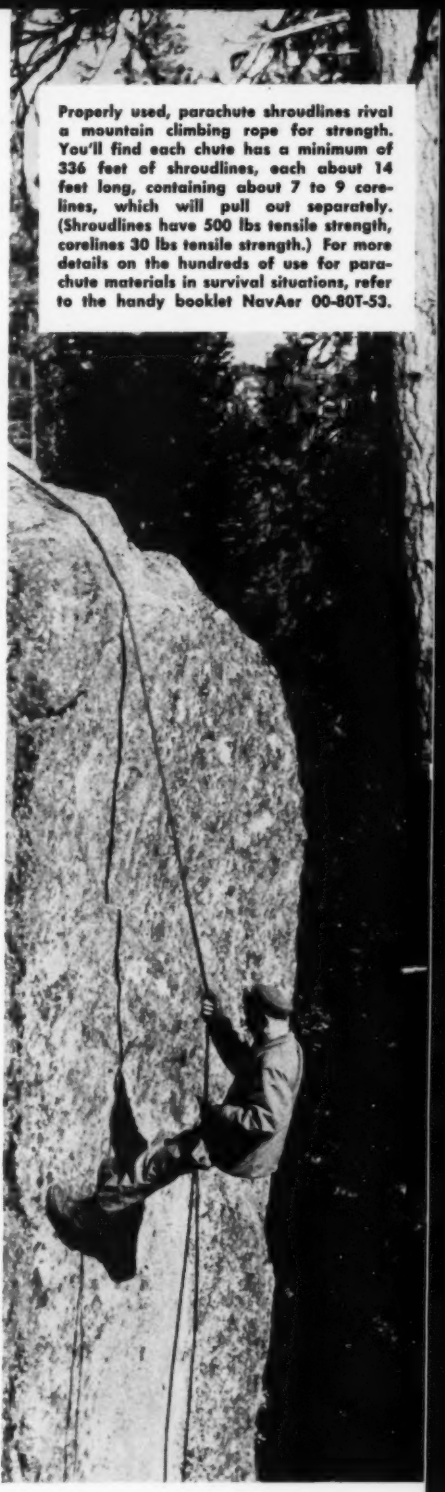
But first there was a tent to make—but what to use for tent rope? . . . After long deliberation, "shroud lines" Sandy thought! "They should be called life lines, not shroud lines." So he made his tent, and lashed limbs together to make a bed and table.

Shroud lines also furnished a means of carrying his pack sack, for making snow shoes, and as a rope with which to climb about his island mountain peaks the days he decided to explore.

From the mountain top, one day he sighted a ship! By now, Sandy was happy with his island life, and his new hobby of saving string . . .

But since his supply was almost used up, he utilized the last length to fly a kite which was sighted by the ship. He was rescued.

That's what little shroud lines are made of. ●



Properly used, parachute shroudlines rival a mountain climbing rope for strength. You'll find each chute has a minimum of 336 feet of shroudlines, each about 14 feet long, containing about 7 to 9 corelines, which will pull out separately. (Shroudlines have 500 lbs tensile strength, corelines 30 lbs tensile strength.) For more details on the hundreds of use for parachute materials in survival situations, refer to the handy booklet NavAer 00-80T-53.

WATER,

Fresh water can be a major problem if you're in a raft very long. But, as this Report on Sea Water indicates, treat those acres of briny H_2O like poison.

WATER, EVERYWHERE ....

SEA water is not safe to drink.

Despite the widely publicized accounts claiming that sea water is harmless, the Naval School of Aviation Medicine advises that survivors should not risk their lives on these unreliable accounts.

The newspaper stories may be especially dangerous because they omit certain conditions, which even the theorists prescribe, as to amounts and intervals to be considered in drinking sea water.

Harmful Three Ways

Salt water is harmful in three ways. It is an emetic, causing loss of body water through vomiting. It is a cathartic, causing loss of body water through diarrhea. It is of course salty, and the body reacts to excess salt by trying to eliminate more than it requires. But since solid salt is not excreted, body water is lost along with it. Some salt is retained, leaving a very salty sailor, and a very dry, thirsty one.

The present survival instruction to the effect that sea water is a poison, and should not be used in any quantity, nor in any form, at any time, is a fair statement of present knowledge of this subject. Your flight surgeon will keep you advised of any reliable developments in this field.

Water is your biggest problem when you're the man waiting on the raft for rescue. And your immediate source of water is on your raft which contains two water-making kits, the solar still which evaporates and condenses salt water, and the Permutit kit, a chemical desalter which precipitates the salt and leaves drinkable water.

How to Get Aqua

When the sun is out, the solar still produces the more palatable water. You will obtain about two pints a day. This still operates most effectively in direct sunlight, but will work at reduced capacity on cloudy days if the weather is hot.

If there is no sun, use the Permutit kit. Each one of the seven packages of chemical makes about a pint of water.

If it rains, catch all you can in a tarpaulin. On a raft rainy days are what you're looking for (except that they delay search and rescue, of course). On these days, drink all the water you can hold.

Save It

Otherwise, don't drink too much. Even if you have it, it's better to save it for a future sunny day. It is especially important to *abstain from water for the first 24 hours.* By that time your stomach has accepted the idea that there isn't much coming, and your body makes better use of any water you do drink.

Make sure your sea voyage is a real rest cruise because every movement uses up moisture.

With your Permutit kit, and your legal still in operation, that salty stuff that's everywhere shouldn't be any temptation. So—don't drink sea water. ●

Had it Made

Everything was going like it should. When the engine froze, you and the crew decided to ditch rather than bail out.

So you rode it down, and through a successful ditching. But then the fun began. In such a case what you don't know about your survival equipment may hurt you. But have a listen to a few words of wisdom from folks who've had difficulties in similar situations.

Watch That Lanyard

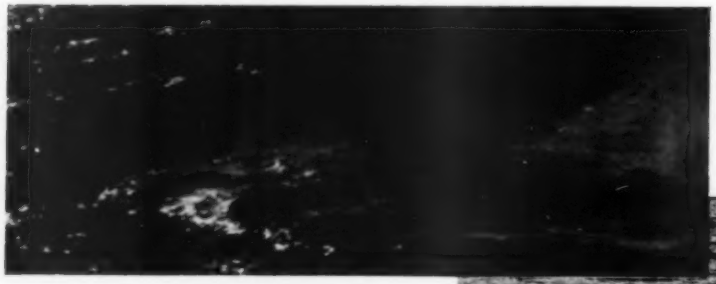
His AD-3Q had an engine failure followed by fire. He went over the emergency procedures and another pilot flying wing again read the emergency procedures to him. At 2500 feet he reported that he was going to unplug the radio and secure the battery; he asked if there was anything else to do. He was reminded of his flaps, which he then lowered.

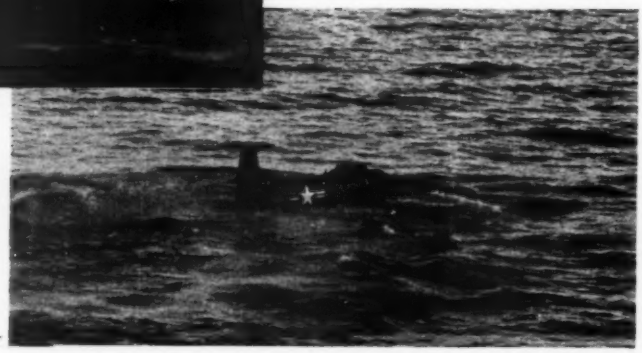
After a very good, three-point tailhook-first, water landing, he climbed out with his parachute fully strapped on with the PK-2 pararaft lanyard up between his legs and hooked to the D ring of his life vest. After unstrapping his chest straps he inflated the vest, unstrapped the parachute and inflated his raft. With the lanyard between his legs he was unable to board the raft until he disconnected it from the D ring. In heavy seas this situation might have caused him to lose his raft. *Note:* The life raft lanyard should be rigged along the right side of the leg under the parachute strap.

He credits his successful ditching to:

1. Assistance received from other members of the flight. They handled all communications, gave the information requested and made suggestions as necessary. 2. Survival training in general.

"At no time did I have any





A ditching doesn't end with getting the aircraft into the water in good shape. Knowing your survival gear intimately is Act II of the drama.

doubts as to the correct procedure," he commented.

A wingman said, "I observed the actions by the pilot and was struck with the similarity of this situation to a training film I had seen." This survivor was calm, cool; and was promptly collected.

Take Enough Time

Others just want to "get outta here fast," like this technician who had two strikes against him. First, he hadn't worn an exposure suit. Second, he left his raft behind in the sinking plane . . . He survived to say, "I advise anyone in the same situation to take their time and not get wet if possible, because the plane floated for at least 4 or 5 minutes."

Haste Again

The AD had an oil leak and there was sufficient time to think and take precautions. This man reported that he had "felt confident until the controller opened his door and the water rushed in. This caused me to hurry and forget my life raft."

He had been overly impressed with training to leave the plane area as soon as possible, so he failed to recover any survival equipment. He was wearing only long underwear and a summer flying suit with a Mae West type life preserver.

He was in the 50-55° water, clinging to the raft of the other crewman for 10 to 15 minutes. His legs became stiff and his arms and gloved hands were becoming so stiff that it was difficult to make coordinated motions.

The other crewman and pilot, who had been in previous ditchings, took their time gathering equipment, entered the rafts and hardly got wet. They had no complaints.

Know ALL Equipment

In another, almost routine ditching, the trouble was caused partly by other persons, but partly by unfamiliarity with equipment.

In the survivor's own words:

"I opened the pack as it came out of the chute and it turned out to be the equipment end. Due to the rough sea I lost every piece of survival gear in the pack.

". . . Although large black print indicated which end of the raft contains survival gear and which end contains the life raft, in fairly rough seas I was not able to read instructions until after I was in the raft.

"I recommend that pilots be made aware of the fact that *the zipper end of the pack contains survival gear and the snap end the raft.* Also that the zipper end not be opened until you are in the raft."

Although the pararaft kit was improperly installed, the situation could still have been avoided if the pilot had been better acquainted with his pararaft kit in particular, and his survival gear.

He was unfamiliar with the feel of the quick-disconnect on the pararaft kit. On reaching for it underwater he attempted to open the pack with the buckle near the snap, confusing it with the lock. Shoulder and leg straps of the chute were unfastened to get to the kit and thus the chute was lost when the kit was removed.

After the pilot boarded the raft he found that the sea anchor was so effective that he had to weigh it in order to paddle over to the dye markers which were floating on the water. He used these, and flares, to attract attention and was rescued. He was uninjured, but was nauseated from swallowing large quantites of salt water while trying to get his raft.

Investigation board recommendations included: 1, Cautioning riggers to pack kits properly, that is, snap end outward. 2, More frequent and thorough indoctrination of pilots in use of survival kits—if equipment is used on heavy seas or in the dark, a sense of feel must be relied on.

Experiences are the best teachers—preferably the experiences of others—or the lesson may be learned too late!

EJECTION

Wham! The canopy jettisons, and Bam! The seat fires, and from then on, to most aviator folk, the ejection picture probably becomes somewhat hazy as to exactly what happens after the pilot rides his chair out of a fast moving airplane.

He knows, or should know, that the percentage of successful ejections from Navy aircraft to date has been remarkably high, 82% to be exact. In fact, above 1000 feet the rate is over 90%! He should also know that this encouraging record of saves is due in large part to the complete knowledge of and adherence to the standard, proven procedures developed to give him an excellent chance of survival.

What he may not understand too clearly, perhaps, is: "What goes on after I go out?" The initial air blast effect, he will quickly affirm, is impressively understandable, yes, but what's the word on this tumbling caper that occurs during high speed, high altitude ejections, hmmm?

Well sir, we're real glad you asked because it just happens that there's some pretty good dope that should interest you. Goes like this:

First, it is reported that a more severe form of tumbling of seat and pilot can be expected during ejection at low aircraft speeds than at higher speeds. This happens because increased air resistance at higher speeds (up to about 400 knots) tends to keep pilot and seat in an upright position. At zero airspeed, for instance, the tendency to tumble is greatest and it decreases as indicated airspeed increases to 400 knots.

(Drogue chutes originally installed to stabilize the seat did not attain the desired effectiveness and have been removed.)

The tumbling which occurs immediately after ejection may exceed 180 rotations per minute, but this rotation lasts only 3 to 5 seconds at altitudes of 30,000 to 35,000 feet or lower, with longer periods of tumbling to be expected at higher altitudes.

Then, in addition, there's a flat-spin type of tumbling, at speeds as high as 240 rotations per minute, which may develop during free fall—which rotation may produce radial forces of acceleration as high as 37 negative G at eye level. The effects of this rotation vary as its center moves from the center of the body towards the head or the feet. For example, remember how the wrestler gets his opponent on his shoulders in an "airplane spin?" There, the center of rotation was about midway of the other gent's body, and the effect would be to force the blood both toward the head *and* toward the feet. Now, when our wrestler grabs his opponent by the hands and swings him about the ring, the blood is forced toward the feet. Similarly, if he swings his man by the feet, that unfortunate individual's blood sort of piles up in the upper portion of the body.

All of which indicates that the point of danger in tumbling may depend on the position of the center of rotation, as well as on the number of rotations per minute and the duration of the tumbling. And what's happening to your physical and thinking processes during all this? Well, studies have shown that with complete interruption of blood circulation to the brain, unconsciousness will occur in 3 to 10 seconds. It is estimated that this would occur at rotation speeds of 160-180 rpm. Small hemorrhages in the eyes occur in 3 seconds at

90 rpm or after 2 minutes at 50 rpm.

Moderately high speed tests produced pain and pressure in the head and legs, followed by headaches. The small hemorrhages don't necesarily jeopardize survival, and it should be noted that the tests conducted were made with subjects wearing no protective clothing.

TUMBLING

Tests showed also that no mental confusion could be attributed to the spins, and the subjects retained the ability to speak and to perform certain mental tasks. However, and this is important, it was found that more time was required to complete physical action, such as releasing a safety belt, and that coordination was disrupted by changing G forces.

From this it may reasonably be concluded that when John Q. Pilot finds it necessary to leave his happy cockpit home by the ejection seat route, he may be subjected to some pretty rugged forces. These forces may vary with the situation and may not be precisely predicted on the basis of data presently available. So it's also logical to assume that in a given situation, the forces encountered may limit the pilot's capability to insure his welfare after he pulls the curtain. It follows then, that some automatic equipment is in order to provide for those situations wherein the pilot may be rendered unconscious or helpless from the effects of a high speed ejection.

As a case in point, the recent ejection of a test pilot from an F-100 at a speed in excess of mach 1 is notable for the reason that from the time he triggered his ejection seat, the pilot was unconscious. The combined action of an automatic seat release device and an automatic parachute opening device appears to have been the real margin of survival for this pilot.

All of which leads up to a heartening assurance for naval aviators. BuAer has affirmed that a complete retrofit program, to incorporate automatic seat releases in jet aircraft, will be completed in 1956, and, moreover, the Bureau advises that an automatic device to open the parachute is in the final phases of testing and will also be available in quantity this year. ●

This article prepared at the request of VC-3. If your unit would like to see information on a particular subject, the Approach will be glad to oblige.

SURVIVAL TRAINING

When an AD ditched, fortunately one of the three men aboard was trained in the use of survival gear. He was the only one to leave the plane with his parachute and raft.

The plane sank in 15 seconds, and all three men hung on to the one raft in heavy seas for 25 minutes until rescued by helicopter. All three of the life vests functioned properly.

One man intentionally left his parachute behind to "cut down on drag" when he left the plane.

The other intended to leave his chute in the plane to prevent being snagged by the many projections in the back seat. He started to remove it, then decided there wasn't time. He stated afterwards that he erred in attempting to take off his parachute. Upon leaving the plane he lost his life raft which came out of its holder.

LAST RESORT

His F2H was struck by a tow cable and fire followed. After failure to extinguish the fire or jettison tiptanks, the pilot leveled the plane and proposed to eject. He had received two ejection seat lectures, two ejection seat runs and normal training lectures. But this situation wasn't normal.

"I pulled the pre-ejection levers with no results. I then tried the emergency canopy release which opened the canopy about 8 inches. After trying to pull the canopy back with no results, I closed it with the electric motor and pulled the T handle to arm the seat.

I ejected *through the canopy* in level flight at about 210 knots indicated and at 9000 feet altitude. My H4 helmet and oxygen mask were with me. Had I not known that the canopy was still on, I would not have been aware of ejecting through it." It was a very successful *last resort* measure.

TIGHT HARNESS

Frequently reports come wherein the pilot complains that after the parachute opens he is unable to sit back in the harness because his leg straps are too tight.

But, let no one make the mistake of wearing his leg straps loose. The more important consideration is that the leg straps be kept tight to absorb the opening shock without any injury to the pilot. After the parachute has opened, then the pilot can loosen the straps.

If this proves difficult, or occasionally impossible—it is still safer and less uncomfortable than it would have been to have loose straps for the opening.

LOOSE HARNESS

An AD was ditched, following fuel exhaustion. While decreased visibility and glassy water may have prevented a successful ditching, when the pilot's body was recovered by a diver it was found to be very loose in the lap and shoulder straps.

The flight surgeon reported that because of the slack lap belt and shoulder harness, the pilot was thrown forward on impact and his face probably struck the gun sight producing complete fracture and laceration of the nose. He was apparently rendered unconscious on impact.

Abrasions of both shoulders and deeper soft tissue damage are additional evidence to indicate that he was thrown forward and halted by the straps. Cause of death was drowning. Perhaps tightened straps would have prevented unconsciousness and allowed this pilot to escape.

NEW REFERENCE LIST OUT

A complete and up-to-the minute listing of all available reference publications concerning Safety, Emergency and Survival Equipment is now available from the Naval Aviation Safety Center. It lists Training Films and Film Strips, Sense Pamphlets, Technical Notes and Orders, BuAer Aviation Clothing and Survival Equipment Bulletins (ACSEB's), Maintenance Handbooks, Accessories and Airframe Accessories Bulletins, and Instructions from BuMed, NavOrd and OCL.

MAINTENANCE

SECTION

WHAT'S WRONG WITH THIS PICTURE?

You're so right—JP is the wrong fuel for reciprocating engines. Besides the label on the fueler there are other ways to determine whether you're getting the right fuel. Please turn the page for a clue on hue and its effect on maybe you!

This article was prepared from material published by the American Petroleum Institute in its Bulletin No. 1503 and Bureau of Aeronautics in Technical Order No. 31-55.

Fuel

Contamination

When it comes to identifying aircraft fuels, color can clue you. For example, a vigilant crew chief examined his fuel prior to acceptance and noted it was colorless. He promptly rejected it as he knew 115/145 fuel should be *purple*, but at a naval air station JP-4 was put in an R4D. The plane crashed on takeoff with fatal results!

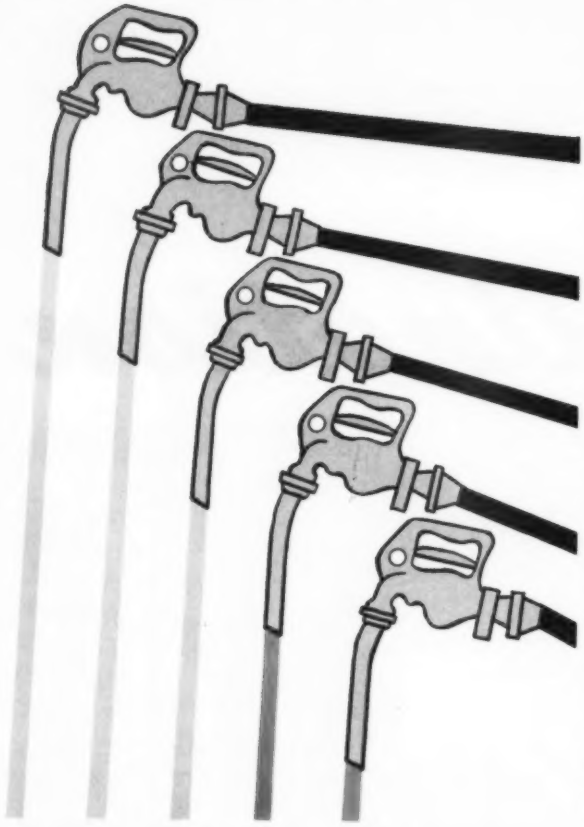
Another activity reported "Suspected contaminated fuel from your refueler. P2V-6 BuNo—has malfunctioning of both engines since refueling at your station with 1135 gal 115/145. Gasoline samples from aircraft indicate color pink."

These and a number of other similar instances of fuel contamination have occurred in various parts of the world. The instances are both too serious and too frequent to be considered acceptable.

The variety of fuels we use to operate the many types of aircraft of the Navy today has increased the number of precautions which are necessary to prevent fuel contamination. In addition to the more familiar contaminants such as water, rust, scale, dust, pump bronze, lint and rubber, contamination by inadvertent mixing of aviation fuels has imposed a serious threat to flight safety.

Fuel can be contaminated in any one of the handling phases from refinery to an airplane. Consequently, final fuel handlers, refueler drivers, plane crews and pilots become the last chance "screens" for prevention. A fundamental knowledge of the characteristics of fuels by this group can avert contamination and possible disaster.

Aviation gasoline (AvGas) contains tetraethyl lead, has controlled anti-knock value (octane number), and is *dyed for identification.* Jet fuel has no anti-knock requirements and is not dyed. (*Continued on next page*)



Aircraft engine fuels currently in use are classified into types and grades and are identified as follows:

AVGAS*

Grade	Color
80	Red
91/96	Blue
100/130	Green
115/145	Purple
108/135 (Com. Spec:)	Brown

JP or JET-MIX*

JP-3 JP-4 JP-5

JET-MIX (2:1) 2 parts JP-5 to 1 AVGAS

JET-MIX (3:1) 3 parts JP-5 to 1 AVGAS

Faintly Straw or Clear

*** NOTE: for applications refer to T.O. • 31-55.**

The vapors of aviation gasoline and jet fuels will ignite at about the same temperature. Jet fuels have higher average boiling points than do aviation gasoline so that they will not evaporate as rapidly as do aviation gasolines.

A very small amount of jet fuel can contaminate aviation gasoline to such an extent that its anti-knock value is reduced. As evident in the case of the R4D, this may affect its performance beyond the critical point. The amount may be so small that it cannot be detected except by laboratory analysis.

On the other hand, contamination of jet fuel with a moderate proportion of aviation gasoline (AvGas) will not normally affect jet engine performance. Slight contamination by piston or jet-engine lubrication oil should not cause trouble, but such contamination should be avoided.

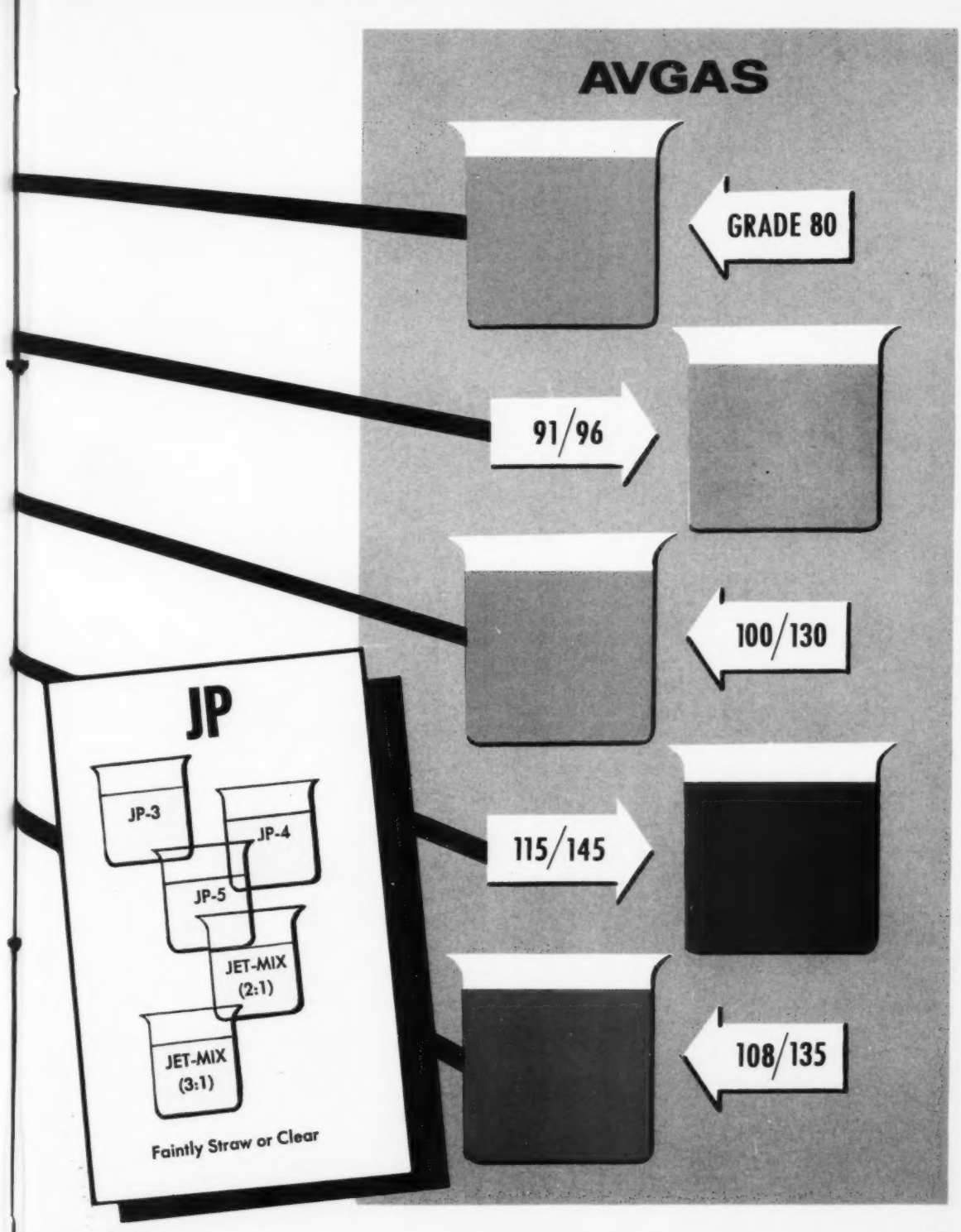
Any contamination with hydraulic fluids and other products, many of which are non-petroleum in origin may seriously affect performance and should be avoided. Jet fuels are otherwise subject to the same contaminants as AvGas and should be checked and handled in the same manner.

Approved alternate or emergency fuels may be added to tanks without draining the aircraft fuel systems. However, when an *approved* fuel is mixed in this manner strict compliance with the requirements contained in T.O. 31-55 must be observed. In general, these are: Aircraft powered with piston engines, the engine operating limits should be those for the lowest grade of fuel in the fuel tank; turbine engine powered aircraft, the maximum engine operating limits, particularly tailpipe temperature and RPM, must never be exceeded regardless of the fuel in use. The T.O. points out that in some cases these operating limits may not be reached when using a different fuel unless the fuel controls are reset.

Always remember that the pilot's approval is required when other than the regular fuel is to be used.

Learn to recognize the characteristics of your aircraft's fuel(s) and especially the colors. The colors of go-juice can tell you much—don't ignore them.

EDITOR'S NOTE: In a subsequent issue the *Approach* will offer suggestions on how to avoid fuel contamination which can occur by means other than mixture with different grades of fuel.


AVGAS
GRADE 80
91/96
100/130
115/145
108/135
JP
JP-3
JP-4
JP-5
JET-MIX (2:1)
JET-MIX (3:1)
Faintly Straw or Clear

From the Ground Up

Notes and Comments on Maintenance

Preparing to tie down that tail section on a jury rig which may have had tail dolly problems.

TAIL AND DOLLY PROBLEMS

RECENT ground accident reports have emphasized problems experienced in the use of, modification of, and the lack of tail dollies in jet aircraft maintenance. Details concerning four of these accidents are presented here:

Case 1. The aft fuselage skin of an FJ-3 was damaged after installation of the tail section when the tail dolly was backed off. The forward fittings of the dolly scraped along the aft lower fuselage when the dolly was elevated after detachment from adapters instead of depressed. The dolly was found to be nonstandard in that the crank to elevate and depress the forward end of the dolly worked in reverse of all others used by the reporting activity.

The operator of the tail dolly was negligent in that he failed to ascertain that the forward end of the dolly had dropped when the jack pressure was released. He backed the dolly off and in so doing deeply scraped the forward fittings along both sides of the aft fuselage section.

Case 2. The tail section of an F9F-2 was damaged when it turned in the tail dolly. It was struck by the wingtip tank of the spreading wing of another aircraft undergoing check. The tail section was on a dolly on the port and aft of the F9F spreading wings. Just prior to this accident someone had moved the tail dolly forward.

Although the mobility of the dolly was a factor in this accident, the primary cause was that inadequate caution by maintenance personnel was used in checking all clearances before spreading the wings.

Case 3. This activity used an A frame to move a tail section which had been lowered onto a mattress. The tail section got away from the personnel holding it and rolled over on the A frame. The activity reported that a contributing factor to this accident was that sufficient cradles were not available.

Case 4. The tail section of an F9F-2 was placed on a TV tail section dolly that had been modified for an F9F-2 tail section. The tail section had been moved several times during the next two days and finally fell from the dolly to the hangar deck. No personnel were in the vicinity of this accident when the tail section fell.

It was determined that the hook which was installed on the dolly to secure the tail section to the dolly bed lacks in its design an overbite, spring-retaining clip or any means of positively causing the hook to be held against the bolt on the tail section. Moving the tail section at various times could have unlocked the hook which secured the tail to the dolly, investigators said.

The reporting activity made the following recommendations:

a. That the hook on converted TV-2 dollies be modified so as to have an overbite on the edge of the hook to hold it over the bolt.

b. That a safety line be tied over the tail section until the modified hooks are installed.

c. That the authorized allowance of F9F-2 tail section dollies be increased to 6 per 20 aircraft to better meet the maintenance requirements.

d. That all maintenance personnel again be reminded of the importance of properly securing all equipment before leaving it.

ACOG—During ground turnup of an SNB-5 on weekly pilot's inspection, the landing gear retracted resulting in sudden stoppage to both engines and minor damage to port and starboard center sections.

The plane at the time was ACOG (aircraft on ground) for a landing gear motor. During the morning prior to the inspection the aircraft had been on jacks and the landing gear cycled during the course of normal troubleshooting and maintenance. The last time the gear was lowered by the maintenance crew, it was done by manually releasing the clutch. from the pilot's seat.

The gear was not properly bottomed by the use of the hand crank following the gravity drop when the clutch was released, hence the collar that attaches the drag strut to the slide tube was not fully down on the slide tube. The dog clutch was re-engaged and the jacks removed from the aircraft.

This condition allows the plane to look normal as far as general appearance of the landing gear, while the collar on the slide tube is about three inches from bottomed. This permits a component of the thrust exerted by the drag strut on the slide tube to be in a direction upward on, or parallel to, the slide tube. When this force becomes great enough the landing gear overload friction clutch slips, allowing the gear to retract.

Investigators were of the opinion that this unsafe condition of the landing gear should have been detected by the inspectors prior to turnup when examining the condition of the wheelwells. In addition, upon starting the engines, the landing gear warning horn sounded but was silenced by the inspecting pilot. The direct causes of this accident were carelessness, improper maintenance procedures and the ignoring of warning device by the inspecting pilots, the board reported.

SUCKED IN—During the process of calibrating the left engine of an F2H a mechanic crawled underneath the aircraft and stood up in front of the intake. The engine which was turning up at 90% partially sucked him into the intake duct. He suffered fatal injury. No engine screen was installed.

As the P5M was towed to the head of the ramp its tail beaching gear exploded.

P5M TAIL BEACHING GEAR HAZARD—A recent failure of a P5M tail beaching gear wheel occurred while the aircraft was being towed to the head of the ramp. The wheel broke and the entire rim, with counterweights attached, was blown outward by the pressure in the tire for a distance of 165 feet. Fortunately, no one was in the path of the 24-pound projectile and no injury or further damage resulted.

Investigation showed extensive metal disintegration. It also revealed the existence of an old crack halfway around the circumference of the wheel which was apparently not detected during previous tire changes. This crack was hidden by the tire sidewall on the inside of the rim.

It is recommended that all maintenance and overhaul personnel working with P5M beaching gear be advised of this hazard and the reminder is made to take advantage of the tire changes and overhauls to check closely for possible flaws or cracks along the inside of either rim. The counterweights should also be removed periodically to inspect for cracks along the outside of the rim.

Any failures detected should be reported in accordance with BuAer Instruction NavAer 00.58A (FURs). *More on the next page*

Vibration caused these electrical leads to break off

CANNON PLUG TREATMENT — Numerous reports of electrical connector failures received by BuAer are attributed to corrosion, contamination or breaking of wires at the solder pot due to vibration. To preclude such failures, the use of sealing compound MIL S-8516 is recommended.

Installation of this material in the back of the connector will seal against moisture or contamination entry and at the same time provide a vibration pad for the wiring. Its dielectric properties reduces the probability of arc-over between pins. To insure that a connector is completely sealed after installation of this sealant, a rubber O-ring is installed between the mating surfaces.

Note: Electronic Material Change 89-55 provides complete information for installing this material. It supersedes EMC 3-54.

Failures of connectors that are common in any particular type aircraft should be reported in accordance with BuAer Instruction NavAer 00.58A of 20 May 1955 (FUR System) so that appropriate follow-up action can be effected.

IT TAKES THREE—The line chief directed the solo pilot of an HRS-1 helicopter into a taxi lane after it had turned off the landing runway. From here another taxi director took over to a point where the aircraft started a 180-degree turn left, into a parking spot between two helicopters. At this point the pilot was turned over to the final taxi director who was posted at the chocks.

The final taxi director then noticed the rotor blades of the taxiing aircraft coming extremely close to those of the helicopter parked to the pilot's left and signaled the pilot to turn away. The whirling blades of the taxiing aircraft struck the main rotor of the parked helicopter, severed its own tail cone and turned over on its right side. Meanwhile, fragments were thrown as far as 140 yards damaging two helicopters on the flight line of another squadron. The pilot, who was not wearing a hard hat, received a laceration of the scalp. His aircraft required major overhaul.

The accident board concluded that the primary cause of this accident was pilot error in that the pilot failed to assure himself that he had adequate clearance before continuing to taxi. Contributing factors were listed as: Inexperience in this model aircraft (pilot's second solo flight), no rider in copilot's seat to help with clearance signals, only one taxi signalman giving clearance signals for both sides of the aircraft, final taxi director did not signal "emergency stop" when he was in doubt and he was positioned too far ahead of the incoming aircraft to insure maximum safety.

In close quarters it takes three to taxi.

The board recommended: when a helicopter is taxied near any obstacles, that two men be stationed ahead (one on each side) to relay clearance signals to the taxi director before allowing the pilot to proceed; avoid taxiing between parked aircraft whenever possible; that wearing of protective helmets be stressed in flight operations of helicopters; stress the reading and compliance of OpNav Instruction No. 3750.1 by all pilots.

Para-a-ade Rest!—A TV-2 which was rushed through a 120-hours check for a fly-by, exploded and caught fire as it taxied out of the chocks.

The primary cause of the accident was the failure of maintenance personnel to properly reconnect the primary fuel line coupling to its fitting on the number 11 air adapter during after-burner basket liner inspection.

Other contributing factors reported by the accident board were:

a. Failure to perform a ground turnup prior to replacing all engine cowling.

b. Release of the airplane for flight without a complete preflight inspection by the plane captain.

c. The attempt to rush through and complete a routine maintenance inspection in order to meet flight commitments.

Reviewing authorities recommended:

a. More attention be given to supervision and inspection of *all* maintenance work by the most qualified personnel; Commenting that "pursuance of an aggressive and realistic training program at the division level within the squadron will eventually result in having every man qualified to perform, supervise and inspect this type of work without risking or compromising safety, which is, after all, still the most important aspect of aircraft maintenance."

b. Squadron maintenance officers and their commanding officers be consistently aware of the fact that doing a job in aircraft maintenance in a hurry is a practice which cannot be condoned. "Speed is in many cases, of course essential; however, each job performed will always have a minimum time required to do it properly and attempts to do the work in less than that time will almost certainly result in carelessness or negligence on the part of even the most qualified and conscientious individual." ●

The Private Life of a Confused Screw

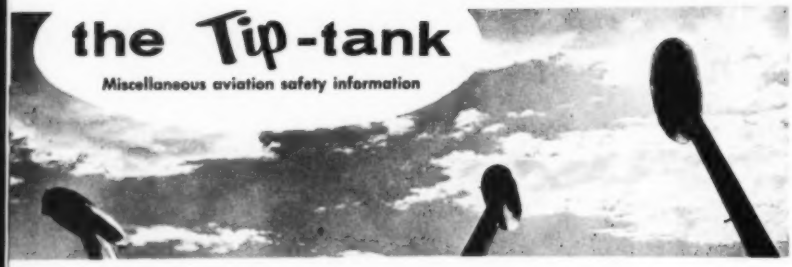
My name is AN 502-416-6. I'm a little screw in the F9F landing gear and my brother (P/N 179934-1) and I have been responsible for some bang-up arrests recently.

I was working the day shift out of Glenview on an F9F-6. The chief, ASC 302A, had insisted that my brother PN 179934-1 take the duty but somebody goofed and I wound up pounding the beat.

Now I'm a taller guy than my brother, with a tendency to hang out in unauthorized places. Therefore my sergeant, F9F Aircraft Bulletin 139, insists that I take washer AN 960-416 along. In this case it didn't work out because I ran into actuating cylinder assembly number 1775801-1 which requires my brother, PN 179934-1, since the chief gave him a special counter bore on this assembly.

Needless to say I bound the works by getting my (*censored*) in the plunger which resulted in the "double crumple." Me and my big flat head! Well, it could be worse if some of my longer cousins got caught in the bind. I understand they have.

You know I'm confused as to just where I do go? I'm sure if you maintenance fellers consulted my chief, ASC 302A, or sergeant Bul. 139 they'd tell you where I can go. That's for danged sure! I recommend you consult them right away.



AIR STATIONS . . .

In his endorsement on a recent night AD-6 wheels-up landing accident report the carrier air group commander made the following suggestions.

He recommeded that all aircraft utilize carrier approach lights for night familiarization landings on the beach or field carrier landing practice. Thus, the runway duty officer can ascertain by the approach light if the wheels are down. This method enables the runway duty officer to make a preliminary gear check at a greater distance than he can with the Aldis lamp only.

If the approach light is not blinking, the watch should advise the pilot to make a pass **without a landing,** so that a further check can be made with the Aldis lamp to see if the gear is down. If the runway duty officer loses voice communications with the aircraft, the Very pistol can of course be used and every effort made to obtain a positive wheel check prior to landing.

If it appears necessary, appropriate procedures can be established for transient aircraft in the pattern.

NEAR-MISS REPORTS

Mid-air collisions continue to be a pressing problem. Because of growing air traffic, the accident potential is increasing. Pilots are urged to report all near-misses, and submit suggestions on how to prevent mid-air collisions. Such information can be sent via official channels or Anymouse forms to the Naval Aviation Safety Center.

FUTURE AIRWAYS PROBLEM?

Judging from the increasing number of near-miss reports received, the problems attendant to sonic speed flight are steadily growing. Latest incident directs attention to an additional threat accompanying a high-speed meeting situation.

An R4D-8 on an IFR flight plan sustained minor damage in the form of buckled stringers and frames when a near-collision with a jet aircraft resulted in a shock-wave bouncing off the transport. Excessive rudder was required to maintain heading of the R4D, which reported the incident to have occurred in a one-mile with-haze visibility.

The jet driver is reminded that, in addition to the problem of collision resulting from high closing speeds and limited reaction time, he now poses a potential threat to nearby aircraft which might encounter his shock-wave in passing.

EXTRA COPIES AVAILABLE

A number of extra copies of the *Approach,* featuring the following special articles, are now available at the Naval Aviation Safety Center. Requests may be forwarded via official mail or Anymouse forms to Director, Naval Aviation Safety Center, Naval Air Station, Norfolk 11, Virginia. Please indicate both subjects and titles, as listed here, together with number of copies required and full address.

For Pilots*

Landing the TV—
Helicopter Accident Summary (Condensed)—
Tilt (Gyro Horizon Errors)—
The Vn/Vg Envelope (Out of Bounds)—
How to See at Night—
Spinning the Fury—
Reversing Techniques (Reversing Troubles)—
Helicopter Operations (Engine Conservation, Clear Landing Area)—
Aero-elasticity (Something's Gotta Give)—
Air-to-Air Gunnery Technique (Walter Smitty)—
Landing the Cutlass—
And Then There Were None—
Jet Transition (The Big Grin)
(Copies of the Jet Annual, containing many of the above, also available).

For Pilots and Aircrewmen*

Parachute Landing Techniques (The Soft Touch, Safe Water Landings)—
G-Suits (G-Whiz)—
Noise that Annoys
Mark IV Exposure Suit (Cool, Man, Cool)—
Pilot Care (Rest Cure) (Pilot Maintenance)—
First Ditchings (AJ, S2F)—
Passenger Briefing (Preflight the Passenger Too!)—
Yellow Sheet Quiz (Push That Pencil)—

For Mechanics, Ground Crew*

Foul Play (Sparkplug Fouling)—
Idle Mixture—
FUR System—
Proper Use and Care of Torque Wrenches—
Calibrating Tailpipe Temperature Controls (TPT Tells the Tale)—
Eliminating Ground and Taxi Accidents (Can You Stop This?) (Airportitus) (Muscles or Missiles?)—
Crash Rescue—

* A complete index of the previous fiscal year will appear annually in the July issue of the *Approach.*

OLD PRO CLUB

ROSTER

John W. Shuff, Lt. Comdr., USN
Air Development Squadron THREE
Aircraft: F7U-3

At 30,000 feet over Groton, Conn. an electrical fire caused battery failure and loss of normal and emergency trim and all electrical systems. In addition, the pilot's seat oscillated between full up and down, cockpit was full of smoke and full nose-up trim state required heavy stick force throughout approach. Exterior loading included a 1000-pound inert bomb. Despite wind gusting to 30 knots Shuff was able to land at Groton airport with no damage or injury.

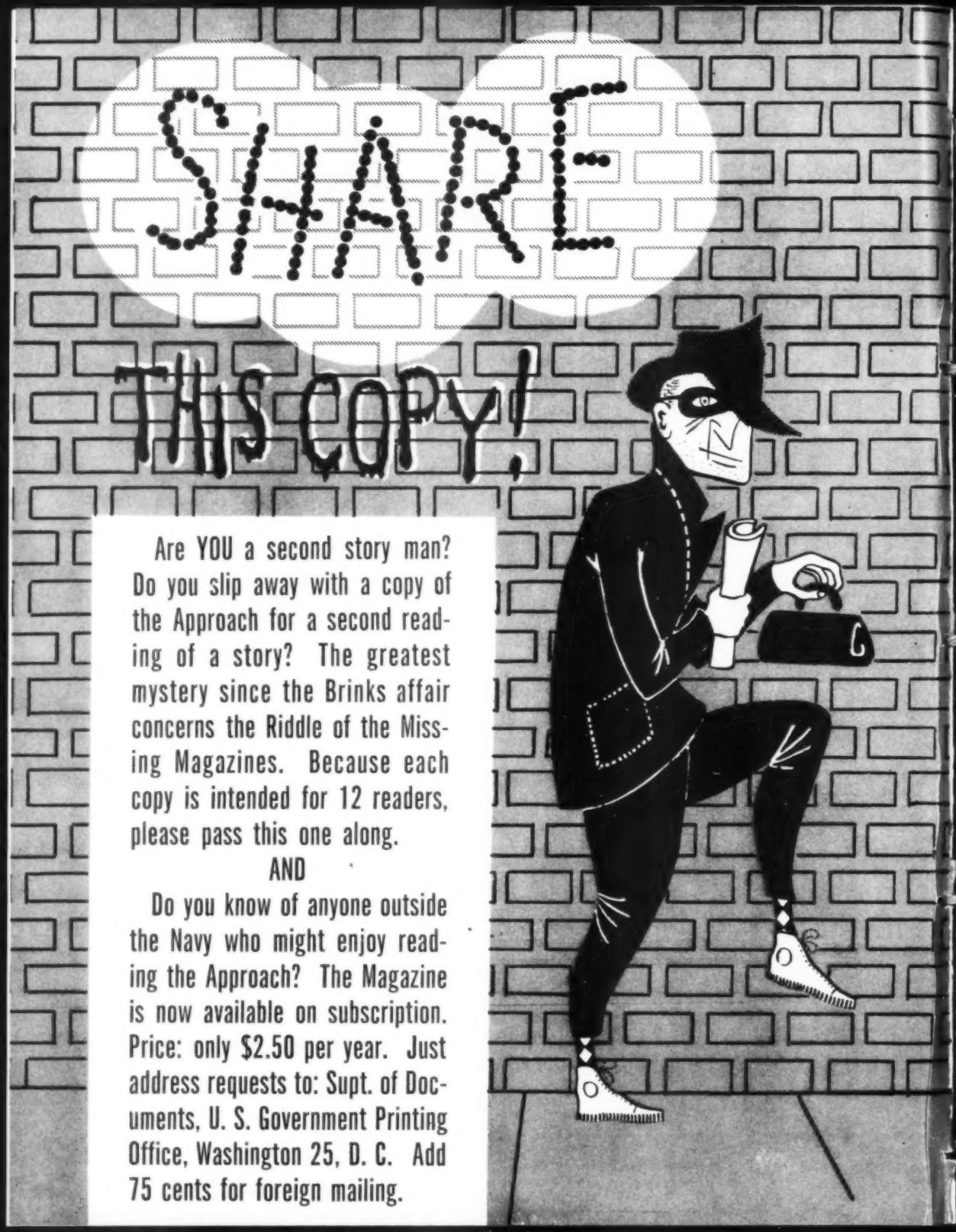
Joseph C. Snare, Jr., 1st Lt., USMCR
MARHAMRON-12, First Marine Aircraft Wing
Aircraft: AD-3

Oil pressure began dropping at 12,000 feet and emergency return to K-2, Korea, begun under ground control vectors. Total power loss occurred 10 miles from field above broken overcast. Broke out below overcast three miles from field, reaching 180-degree position at 2000 feet. Snare completed successful dead-stick landing with no damage to aircraft.

Bernard A. Munsey, Lt., USNR-R
NARTU, MCAS, Miami
Aircraft: P4Y-2

Approaching NAS Quonset IFR above a solid overcast, complete radio failure was experienced, from a collision with an unidentified object, possibly a bird. Taking up a heading which would remove him from high density traffic area, Munsey commenced prescribed emergency pattern and, with weak radio reception, was vectored to Logan Airport (Boston) for a uneventful landing in near zero-zero field conditions.

Recognition of heads-up flying is essential to a positive program of flight safety. For this reason the *Approach* will acknowledge each month, certain selected individuals whose exhibited flying ability merits membership in the "Old Pro Club" of naval aviators. Commanding Officers are invited to submit nominations for selection.



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